

Exhibit # 669

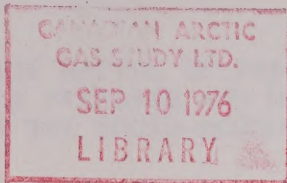
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July 7, 1976

Mr. Ian G. Waddell,
Special Counsel,
Mackenzie Valley Pipeline Inquiry,
Resources Building,
Yellowknife, Northwest Territories.

Dear Sir:

Re: Phase IV Evidence, Subjects Relating to the
Socio-Economic Environment - Mackenzie Valley
Pipeline Inquiry

The first panel for Foothills Pipe Lines Ltd. on Phase IV will deal with subjects relating to the socio-economic environment, and will consist of the following persons:

J. K. Burrell,
J. R. Ellwood,
M. E. Jensen,
J. B. MacLeod.

The prepared evidence for this panel is enclosed herewith.

Yours very truly,

R. J. Gibbs, Q.C.

/cbm.

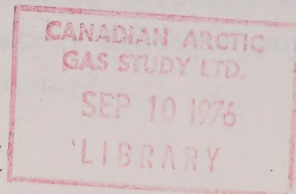
cc: Mr. Ian Scott, Q.C.,
All Participants.

BEFORE

THE MACKENZIE VALLEY PIPELINE INQUIRY

IN THE MATTER OF PHASE IV
THE IMPACT OF THE PIPELINE AND MACKENZIE CORRIDOR
DEVELOPMENT ON THE SOCIO-ECONOMIC ENVIRONMENT

FOOTHILLS PIPE LINES LTD.
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FIRST PANEL ON PHASE IV

SUBJECTS RELATING TO THE SOCIO-ECONOMIC ENVIRONMENT

PREPARED EVIDENCE

ON A PANEL CONSISTING OF:

J. K. BURRELL	-	VICE PRESIDENT CORPORATE DEVELOPMENT FOOTHILLS PIPE LINES LTD.
J. R. ELLWOOD	-	SUPERVISOR, SOCIO-ECONOMIC AFFAIRS FOOTHILLS PIPE LINES LTD.
M. E. JENSEN	-	INDEPENDENT SOCIO-ECONOMIC CONSULTANT
J. B. MACLEOD	-	INDEPENDENT ECONOMIST AND MANAGEMENT CONSULTANT

July 7, 1976

FOOTHILLS PIPE LINES LTD.
PREPARED EVIDENCE OF FIRST PANEL ON PHASE IV
BURRELL, ELLWOOD, JENSEN, AND MACLEOD

1. Q. Mr. Burrell, what is your position with Foothills Pipe Lines Ltd.?

A. I am Vice President of Corporate Development.

2. Q. Does the sheet attached to the prepared evidence and having your name at the top accurately describe your academic qualifications and experience?

A. Yes.

3. Q. Would you read the contents of the sheet please?

(Witness reads his academic qualifications and experience into the record.)

4. Q. Do you have overall responsibility for the Foothills' socio-economic program?

A. Yes, I do.

5. Q. Mr. Ellwood, you are Supervisor of Socio-Economic Affairs for Foothills Pipe Lines Ltd.?

A. Yes.

6. Q. Does the sheet attached to the prepared evidence and having your name at the top accurately describe your academic qualifications and experience?

A. Yes.

7. Q. Would you read the contents of the sheet please?

(Witness reads his academic qualifications and experience into the record.)

8. Q. Ms. Jensen, what is your association with Foothills Pipe Lines Ltd.?

A. I am an independent social consultant and I have been retained by Foothills to provide input to their proposed project in any areas where there may be sociological concern in relation to the impact of this project in the Northwest Territories.

9. Q. Does the sheet attached to the prepared evidence and having your name at the top accurately describe your academic qualifications and experience?

A. Yes.

10. Q. Would you read the contents of the sheet please?

(Witness reads her academic qualifications and experience into the record.)

11. Q. What has been your contribution to Foothills' socio-economic statement?

A. I have been responsible for the analysis of contemporary northern society described in the socio-economic statement. I have assessed the potential social impact and made recommendations to the Applicant in order to minimize the adverse effects of pipeline development.



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12. Q. Mr. MacLeod, what is your association with Foothills Pipe Lines Ltd.?

A. I am an independent economic and management consultant based in Inuvik, Northwest Territories. I have been retained by Foothills Pipe Lines Ltd. since January 1975 to advise the Applicant on matters relating to the economic impact in the Northwest Territories of the proposed pipeline.

13. Q. Does the sheet attached to the prepared evidence and having your name at the top accurately describe your academic qualifications and experience?

A. Yes.

14. Q. Would you read the contents of the sheet please?

(Witness reads his academic qualifications and experience into the record.)

15. Q. Would you briefly summarize your contribution to the Applicant's socio-economic statement?

A. I have been responsible for projecting demographic changes, northern manpower availability, entrepreneurial opportunities, creation of secondary employment and potential fiscal impact resulting from hydrocarbon development in the Territories, and have participated in the assessment of the impact of increased personal incomes of northerners who would accept pipeline related employment.

16. Q. Mr. Burrell, what is the overall objective of the Foothills' socio-economic program?

A. Our objective is to ensure that our pipeline system is planned, constructed and operated in such a manner that it offers the maximum net benefit to the residents of the Northwest Territories.

17. Q. How do you propose to accomplish this objective?

A. The first step in this process has been to assemble a description of the current socio-economic patterns and trends in the Mackenzie/Great Slave areas. In assembling this description, we have relied on the existing data sources and on the personal knowledge and experience of consultants who are residents of the area.

The second step in our program is to identify the potential interaction between our project and the existing socio-economic milieu. As an example, we have been working to define the interaction between our project and the transportation system, the education system and the labour force. These and other topics will be dealt with later in our evidence.

The next step in the process, then, is to predict the effects of the project on the existing socio-economic environment and to obtain feedback from the persons, communities or governments affected and to use that feedback as input to possible project modifications.

18. Q. What input has the socio-economic department had to the Foothills' project?

A. Our input to the project has been on many levels, but

we have concentrated on developing company policies which are compatible with what we perceive to be the desires expressed by the people of the region. Some key areas of policy which we have been involved with are:

- (1) timing of the project, vis à vis the land claims question;
- (2) separation of the construction work force from the communities; and,
- (3) the provision of natural gas to northern communities.

In addition to these general policy areas, we have also been active in specific project planning such as route and facility locations, training and employment, and involvement of northern businesses.

19. Q. In assessing the socio-economic impact, what area or region did Foothills consider?

A. Our socio-economic impact assessment addressed the Mackenzie Valley corridor basically as defined by the Department of Indian Affairs and Northern Development. This corridor was, however, modified to reflect gas supply from the Beaufort Basin only and expanded to include those communities located outside the original corridor to which we propose to provide natural gas service. Figure I in the Appendix illustrates the area that we have considered.

20. Q. Mr. Ellwood, what policy positions has your company taken towards minimizing the social impact which the pipeline could create?

A. Firstly, most will agree that because of the nature of the project, the level of activity, and the number of workers involved, it is the construction phase of the project which presents the greatest concern.

For the construction phase, we have adopted the following policies and plans in order to minimize the adverse social effects that our project might have on the residents of the North.

- (1) Routing of construction personnel to and from the jobsite will be done as expeditiously as possible. The existing airports at Fort Simpson, Norman Wells and Inuvik will be utilized as points of arrival and departure from and to the workers' home location and connecting transportation will be scheduled so that there will be minimal waiting time at these airports.
- (2) Transportation to the point of hire will be provided for all workers who quit, are fired, or leave their work for any reason.
- (3) Construction workers will be housed in self-contained camps, well removed from the communities.
- (4) Casual transportation will not be made available to any of the construction camp workers for any purpose.
- (5) The construction camps will provide emergency

health services and it is expected the majority of illnesses and accident cases will be treated at the camps. However, when hospitalization of any of the workers is required, it will probably be provided at regional hospitals, or, in some cases, at hospitals in the South. While the provision of regional hospital facilities is not the responsibility of Foothills, we are concerned that adequate hospital facilities are available during the construction and operational phases to meet not only our needs, but those of the public at large. To this end, we have consulted and will continue to consult with the responsible government agencies.

- (6) We see the need for a system which could overcome the fears that all able-bodied residents of the smaller communities could choose pipeline construction employment, thus leaving the community in a position of not having sufficiently qualified people necessary to provide those services which are essential to the well-being of the community. Therefore, we are willing to consider employment rotation and labour pool systems during the construction phase, however, before this could become workable, all parties concerned would have to be in agreement with the system to be adopted.
- (7) Foothills recognizes that law enforcement must remain under public control. We have consulted and will continue to consult with the responsible agencies so that they are fully aware of our project so that they too can plan towards ensuring that adequate law enforcement facilities are in

place at the time of construction and beyond. Foothills will, of course, provide camp and right-of-way security and routine policing of our own regulations and permit conditions during construction. Co-operation and accessibility to the camps and work sites will be available to the R.C.M.P. or other peace officers pursuant to their responsibilities. Further, we will provide to the R.C.M.P. at all major camp sites office space, accommodation and access to communication facilities.

- (8) All contractors and sub-contractors will be required to observe the same regulations which Foothills has set for itself, whether imposed by permit restriction or not.

21. Q. During previous testimony to this Inquiry, Mr. Blair stated that Foothills' policy would be one of controlled access to alcohol. How do you propose to implement this policy?

A. We intend to provide a tavern in all of our major camps subject to the Territorial Liquor Ordinance and any local regulations prohibiting or restricting possession or sale of alcoholic beverages. We anticipate that the taverns will operate for a limited time during the evenings and they will be restricted to employees of Foothills, our contractors and sub-contractors and to authorized guests of Foothills.

22. Q. What is Foothills' position with respect to the availability of firearms or fishing equipment in the camps?

- A. Firearms, with the exception of those provided to the camp superintendent for safety purposes, will not be permitted in the camps.

As far as fishing gear is concerned, we have modified our thinking since the date the Application was written and we now take the position that if a worker obtains the required fishing permit and doesn't violate any regulations, he should be allowed to go fishing during his free time. Given the overall construction schedule, major impact on fish resources is not expected throughout most of the project area; however, potential does exist for excessive pressure on some local fish stocks. We will continue to co-operate with the governmental agencies responsible for the management of fish resources in order to alleviate this potential.

23. Q. When the workers, especially those from the smaller northern communities, are in the construction camps it may be difficult for them to send money home to their families, which, of course, could cause financial problems at home. Has Foothills any plans to alleviate this problem?

- A. All workers will have the option of having their paycheque sent to the location of their choice including their home address or directly to their bank account.

Northern employees, through the counselling services which will be available, will be made aware of the options that will enable them to provide money to their families while they are "out on the line".

24. Q. Mr. Ellwood, in your opinion, will the operational phase have the potential to create as many detrimental social impacts as the construction phase?

- A. No, primarily because the number of operations personnel

is only 5% of the estimated peak construction force. In addition, these employees will reside in Yellowknife, Fort Simpson, Inuvik, and Norman Wells, all of which have experienced some development.

25. Q. Over what time span will the operations personnel be moving in to these communities?

A. As shown by Table II in the Appendix, the increase will be gradual over a six year period commencing one year after the permit is awarded.

26. Q. It has been said that an acute housing shortage exists in the Northwest Territories. What does Foothills intend to do in this regard?

A. We do not want to add to this problem, therefore we will be providing accommodation for all our permanent employees located in the Northwest Territories. In providing this accommodation, as in all other areas, we will be making no distinction between employees who are residents of the Territories and employees who come from outside the Territories. Foothills will also encourage their O & M personnel to purchase their homes rather than rent them from the company. While it is premature at this time to outline the actual mechanism of such a home ownership plan, we can say that it is our intention to make it at least as attractive for our employees to own their own home as to rent.

27. Q. How will you decide where to place these houses in the O & M centers?

A. We have had some preliminary discussions with these communities and none appears desirous of having a

company housing sub-division in their midst, nor do we want such a situation. We will be working closely with the communities to be certain that what we are planning to build in their communities is satisfactory to them.

28. Q. What facilities besides houses will you be locating in the four communities you mentioned earlier?

A. In Fort Simpson, Norman Wells and Inuvik, we will also have district operating headquarters and our O & M headquarters will be in Yellowknife.

29. Q. Has Foothills developed a compensation policy to cover accidental damage during the construction phase?

A. Yes, the philosophy of our compensation policy is basically that a person who has been adversely affected should be compensated in such a manner that he is equally as well off after the construction of the pipeline as he was initially. As well, he should not suffer in any way because of any above ground facilities constructed by the pipeline company, nor should he suffer in any way should the pipeline cause him any damage during the entire time it is in operation, or at any time his land need be disturbed by our maintenance crews.

30. Q. How would this policy be put into practice by Foothills?

A. As a practical matter, it will of course be necessary for anyone who feels he has a legitimate claim against our company to bring the matter to our attention. We recognize that this implies an obligation on our part to make ourselves accessible and we propose to do this

by locating the persons responsible for settling damage claims in the Northwest Territories and by making their names, addresses and telephone numbers known to the residents, organizations and community councils of the region.

Once this initial contact has been made, we would expect the normal process of negotiation between the claimant and the company to arrive at a mutually agreeable estimate of the extent of damage. Compensation would then be paid on the basis of replacement value for damage to property and the fair market value for loss of productivity. In addition, compensation for inconvenience, stress, or other "non-quantifiable" items is expected to be part of the negotiations in the Northwest Territories in the same or similar manner as is the current practice in the rest of Canada.

In the event that agreement can not be reached through negotiation, the matter would be referred to an arbitration board. We recommend that consideration be given to establishing these boards on a regional basis, prior to the commencement of construction, with the board to consist of one member appointed by the pipeline company, one member appointed by an organization such as the local Hunters and Trappers Association or Band Council, who could act on the behalf of potential claimants, and a third member to be appointed by the preceding two.

31. Q. Ms. Jensen, have you provided advice to Foothills Pipe Lines Ltd. on the subject of social concerns related to the proposed pipeline development?

A. Yes, in the areas of housing, education, health and other areas.

32. Q. Would you elaborate on the existing housing situation in the Northwest Territories and the likely effects of the Foothills' proposal?

A. The Northwest Territories is experiencing and will continue to experience a housing shortage according to Need and Demand studies quoted in the "Mackenzie Valley Entrepreneurial Study" conducted in 1974. These studies show that over a five year period, (from 1975 to 1980), 1,382 new housing units would be required to adequately house the Mackenzie District population. Gemini North Ltd., while preparing the "Social and Economic Impact of Proposed Arctic Gas Pipeline in Northern Canada" did extensive research into northern housing and their data show shortages of 1,719 housing units with an occupancy density of 3.0, 1,107 with a density of 3.5 and 660 with a density of 4.0 for 1973. Neither of these studies take into account population increases as a result of development.

During my own research for the N.W.T. Housing Corporation in 1973, it became apparent that the chronic problem of housing shortages was further compounded by inequitable distribution.

Although I do not have exact figures on the number of

housing starts since 1973, I am confident that there have been insufficient numbers of houses constructed during this period to overcome the shortage and I am also convinced that there will continue to be a shortage during the construction and early years of operation of a gas pipeline.

33. Q. You have made certain recommendations to Foothills with regard to housing. Would you please tell us what these were?

A. I have recommended that:

- (1) During pipeline construction, the camps used to house workers should be self-sufficient;
- (2) These camps should be isolated, as much as possible from communities, and the workers should be transported directly to the work site from the major airports;
- (3) Accommodation required for supervisory personnel in the operating centers during construction of both pipeline and O & M facilities should be permanent rather than temporary;
- (4) Early consultation with local government authorities should be initiated to ensure availability of serviced land for housing and O & M facilities and conformity with local development plans and zoning by-laws; and,

- (5) Foothills should develop a policy that would encourage its permanent O & M personnel to become home owners rather than tenants.

34. Q. Please give us the rationale for your recommendations?

- A. The self-sufficiency of camps would ensure that pipeline construction workers would place no additional burden on housing supply or public accommodation. Having camps isolated and having direct transportation to the work site would ensure that southern pipeline construction workers will not place any demand on housing in the communities.

The construction of permanent housing for supervisory personnel during construction of the pipeline and of the O & M facilities in Inuvik, Norman Wells, Fort Simpson and Yellowknife would place no strain on the existing housing supply. In addition, this practice would initiate the phasing in of Foothills' ultimate housing requirements. This process will also minimize the potential of operating centers taking on the physical appearances of construction camps.

With respect to my recommendations regarding local consultation, Foothills has already initiated preliminary discussions with local government officials in each of the proposed O & M centers.

Home ownership has been recommended because to date there has been a tendency for southerners moving North to maintain a pattern of transient residency. It is my belief that this pattern is reinforced, in many cases, by the provision of subsidized rental accommodation as a condition of employment. Therefore, the

implementation of an home ownership policy may discourage Foothills' personnel from continuing the existing pattern.

In addition, a home ownership policy is in accord with policies recently introduced by the N.W.T. Housing Corporation.

35. Q. Have you made any other recommendations that are related to housing?

A. Yes.

- (1) During construction of District O & M facilities and employee housing, local contractors should be utilized as much as possible.
- (2) Establishment of a central facility in any of the N.W.T. communities to be used as an orientation or manpower staging site should be discouraged.
- (3) A multi-media campaign should be instituted in the South shortly after the permit to construct is issued to discourage speculative transients from coming North.

36. Q. Would you please elaborate on the rationale for these recommendations?

A. The use of local contractors to construct personnel housing and O & M facilities should minimize the requirement for imported labour in this area. Therefore, there should be a corresponding minimization of additional housing requirements. This policy would also encourage northern participation and help to stimulate the local economy.

Orientation programs for southern pipeline workers, if conducted in southern centers, or at the camp site, would eliminate the need to provide classroom and housing facilities in the northern communities.

Similarly, orientation programs for northerners, if conducted in their home communities, would eliminate the need for housing these people while they are going through this process.

The housing of transients who come to the Northwest Territories seeking pipeline or other employment should not be the responsibility of Foothills, nor should the control of transient movement be Foothills' responsibility. Construction personnel have indicated that pipeline craft union and construction trade hiring halls will probably be located in Edmonton and Vancouver as compared to Alaska where union hiring halls are situated in Fairbanks and Anchorage, thereby encouraging southern residents to come to Alaska seeking pipeline employment. Locating union hiring halls outside the Northwest Territories and sponsoring multi-media information programs to that effect in the South prior to and during construction should mitigate the problem somewhat.

37. Q. Ms. Jensen, what is your assessment of the probable impact that the Foothills' project will have on housing in the Northwest Territories?
- A. It is not yet possible to determine the actual numbers of dependents in addition to the operations personnel who will require permanent housing. Therefore, a quantifiable assessment at this time would be inaccurate and invalid.

Foothills' approach to pipeline development during research, planning, and policy formulation has been one of attempting to minimize the potentially disruptive socio-economic consequences of development. It is my opinion that the Foothills' project will place relatively little demand on the existing Northwest Territories housing supply as it will be Foothills' policy to assume responsibility for accommodating its permanent employees through either encouraging home ownership or providing rental units.

With Foothills' stated intention of making home ownership at least as attractive as renting, there exists a possibility that the present ratio in the Northwest Territories of only 10% owner-occupied dwellings to 90% tenant-occupied dwellings could begin to shift towards the Canadian average.

38. Q. Ms. Jensen, would you describe for us the general health care delivery system in the Northwest Territories?

A. The health care system in the Mackenzie District is characterized by a system of nursing stations in small communities supported by regional hospitals in urban centers. The Inuvik General Hospital with a capacity of 129 beds serves as the regional referral center from Fort Norman north. Stanton Yellowknife Hospital with a capacity of 73 beds provides general hospital care for the Upper Mackenzie/Slave Lake region. Hay River and Fort Simpson also provide hospital care and have a combined capacity of 36 beds. Expansion of the Hay River Hospital is planned for 1976 and bed capacity will be increased to 50 beds. Patients requiring care beyond the capability of the regional hospitals are transported to southern medical centers.

39. Q. On any construction project, one can expect a certain number of industrial accidents. With this in mind, what effect would the construction phase have on the existing health care delivery system?

A. As stated by Mr. Ellwood, minor illnesses and industrial accidents will be treated on site. With regard to more serious illnesses and accidents, Gemini North Ltd's research based on the pipeline industries' experience in southern Canada shows that 18% of all pipeline construction accidents require hospitalization. Using the formula devised by Gemini North Ltd. and applying it to Foothills' manpower requirements, we arrived at the projections as shown in Table III of the Appendix.

Our projections from Table III show negligible numbers requiring hospitalization with the exception of peak construction years when the number of accidents requiring hospitalization increases from a low of 5 to a high of 71 during the first year of construction.

For those accidents requiring hospitalization, established northern health care patterns would prevail, i.e., the patient would be transported to the closest regional hospital, extent of injuries determined, and either admitted for treatment or transported south.

40. Q. What do you anticipate the effect will be during the O & M phase?

A. During the O & M phase, Foothills' employees will be integrated into four operating centers -- Norman Wells, Inuvik, Fort Simpson and Yellowknife. Each of these communities has adequate medical facilities to absorb population increase (due to pipeline construction and operation) without further expansion or diminished levels of health care services. Some increase in medical personnel may be necessary depending on the staff levels at the time the permits are issued.

41. Q. Are there other aspects of health in the Northwest Territories that could be affected by Foothills' proposal?

A. Yes. Inadequate sewage and water treatment facilities affects certain disease and infant mortality rates.

Statistics show that the Northwest Territories has the highest infant mortality rate in Canada. While infant

mortality rates show an improvement since 1970, the "Report on Health Conditions in the Northwest Territories, 1974" states: "We can only repeat the absolute necessity for improvement in general living conditions, water supply and sanitary disposal if we are to achieve any real reduction in this rate."

Also, closely related to poor living conditions, water supply and sanitary disposal are the incidence of bacillary dysentery and infectious hepatitis and again this incidence is much higher in the Northwest Territories than elsewhere in Canada. Examples of recent statistics are shown in Tables IV and V of the Appendix.

Being aware of this problem, Foothills, whenever possible, will be designing modular sewage and water treatment facilities in sizes which could be suitable for permanent use in the communities. Since some of these installations will be surplus following construction, Foothills has stated they are prepared to make those which are surplus, available for use in the communities.

42. Q. Ms. Jensen, could you describe the existing education system in the Mackenzie District of the Northwest Territories?

A. Formal education began in the Mackenzie District over one hundred years ago when the Gray Nuns established a residential school at Fort Providence in 1867. The Mission school system was expanded somewhat during the first half of the century, but it wasn't until the Federal Government became responsible for education in the 1950's that the foundation was laid for the present system. Responsibility for northern education was transferred from the Department of Indian Affairs to the Territorial Government in 1967.

From such meagre beginnings has evolved a system which places education within the immediate reach of all northerners. All communities in the Mackenzie District offer at least an elementary education, supplemented by an adult education program. Students who want to attend high school or post-secondary institutions are required to live away from home in the urban centers of the Mackenzie District or southern Canada depending to what level of academic or vocational achievement they aspire.

Costs of acquiring an education are completely absorbed by the Territorial Government and, in fact, education is the largest single budgetary expenditure of the government. School enrollments for all ethnic groups residing in the region have risen steadily and an increase of over 8,000 students has occurred from 1960 to 1975 throughout the territory. During this same

period, the number of Indian students has doubled and the number of Inuit students has tripled. Estimated enrollments in the Mackenzie District for the 1975/76 school term are 3937 elementary students, 1795 high school students, 155 vocational students, 165 university students, and 185 enrolled in adult education classes.

Administration of the education system is decentralized with regional education offices being located in Inuvik, Fort Smith and Hay River. Territorial administration is conducted from Yellowknife. While southern style school boards have not been developed with the exception of Yellowknife and Rae-Edzo, elected school advisory committees have been established in most communities.

43. Q. Would you now describe the probable effects of the Foothills' project on the education system in the Mackenzie District?

A. We have calculated expected student increases for all operating centers and also the expected classroom additions resulting directly from pipeline operations and secondary development. Table VI in the Appendix shows the number of school age children expected to move into operating centres after construction. The increases in enrollment are spaced out over a five year period in the valley and delta communities and over three years in Yellowknife.

Should residents in the smaller valley communities opt for employment during the operations phase and establish residences in the operating centers, we could expect these figures to increase somewhat as native northerners tend to have larger family units than southerners.

This would result in a corresponding decrease in school enrollments in the smaller Mackenzie District communities.

While it is not possible to predict the number of persons residing in any of the four operating centers who may opt for pipeline employment, their participation would reduce the predicted numbers accordingly.

Pipeline development would necessitate limited expansion in all operating centers (Inuvik, Norman Wells, Fort Simpson and Yellowknife) and it is my belief that the capability to provide additional facilities is available provided that sufficient lead time is given to the education authorities.

44. Q. Do you anticipate any other activity in the education system as a result of Foothills' project?
- A. Yes. As pipeline and other development becomes imminent, we can expect to see increasing numbers of community residents enrolling in adult education programs to upgrade their basic skill levels, anticipating employment. Indeed, movement in this direction has already begun. The residents of Tuktoyaktuk requested a clerk typist course in the fall of 1975. Three students have completed the course and are now locally employed; the other two students are currently in the last stages of the program.

Preliminary discussions between Delta residents, the Department of Education officials, and representatives of industry are exploring the possibility of establishing a vocational training facility in the Delta.

Most communities situated in the Mackenzie Valley currently have adult education programs for residents. Primary emphasis is placed on Basic Job Readiness Training and Basic Training for Skill Development, supplemented by home management and local interest programs. Education officials estimate 185 northerners are presently enrolled in community adult education throughout the district and they have indicated to me they foresee no difficulties expanding present capacity should demand increase.

45. Q. Ms. Jensen, much discussion in the Northwest Territories centers around the problem of alcohol abuse. Would you briefly describe the current situation?

A. It is generally recognized that alcohol abuse is Northern Canada's most serious social problem. Alcohol abuse is directly related to other social problems such as poor physical and mental health, high accident rates, high crime rates, family unit breakdown, and child neglect.

Canadian statistics published by the Northwest Territories Alcohol and Drug Co-ordinating Council in their 1974 Annual Report show a relationship between the amount of personal disposable income and per capita consumption of alcohol. For instance, in 1973 the Northwest Territories had the second highest rate of alcohol consumption in Canada and also the fourth highest per capita income, as compared to New Brunswick which had the lowest personal disposable income and the second lowest alcohol consumption rates.

Such statistics support a widely held northern belief that increased disposable incomes resulting from pipeline employment will further add to the already severe alcohol problem that exists. It is my opinion that while such a possibility is real, the way to avoid the problem is not to restrict access to high paid employment but to create an environment in which the population is aware of the inherent dangers associated with excessive alcohol consumption and to provide the necessary support services and rehabili-

tation programs necessary to minimize the problem.

Responsibility for initiating alcohol education and rehabilitation programs lies primarily with the government; it is my belief that efforts should be directed to assisting community groups and agencies whose primary function is to promote responsible drinking behaviour and treatment programs for those residents having a need.

46. Q. Have you made any recommendations to Foothills with regard to alcohol consumption in relation to their project?

A. Yes I have. With regard to alcohol consumption in the construction camps, I made the following recommendations for management to consider:

(1) Tavern facilities should be provided where feasible;

(2) Counselling services should be provided at the work site.

47. Q. What is the rationale behind these recommendations and why was prohibition not recommended?

A. By providing tavern facilities, Foothills could integrate the consumption of alcohol into the overall camp recreation program. It is my belief that appropriate behaviour with respect to alcohol can be best realized if alcohol is available in an atmosphere conducive to sociability as opposed to consumption. Therefore, by providing, encouraging, and supporting participation in such recreational activities as cards, shuffleboard,

pool, movies, etc., the propensity towards heavy consumption should be reduced. Creating a suitable social environment in which to consume alcohol is a recommendation made by W. Wacko in his report to the Government of the Northwest Territories in 1973.

Alcohol consumption and abuse has been and continues to be a disruptive element in the work force. Therefore, I have recommended that on-site social counsellors be provided in an attempt to alleviate some of the problems resulting from alcohol abuse.

Absolute prohibition of alcohol was discarded as a policy because, I believe, outright prohibition would be unworkable for the following reasons:

- (1) Experience indicates that one can limit or control access to alcohol, but one cannot force people to stop drinking. Some form of bootlegging can be expected to evolve from prohibition.
- (2) Liquor is associated with certain forms of recreation. Prohibition on the use of alcohol at camps, during construction, may meet strong resistance from workers and their unions.

48. Q. Ms. Jensen, what is the current situation in the Northwest Territories with respect to the incidence and nature of crime?

A. As elsewhere in Canada, the Northwest Territories has seen crime rates increase over the past decade.

Data presented by Gemini North Ltd. in their "Social and Economic Impact of the Proposed Arctic Gas Pipeline in Northern Canada" showed that during the period 1967 to 1972 the incidence of crime per 100 population roughly doubled for crimes of violence, liquor ordinance violations, assaults and crimes against property.

Increased crime rates occurred at the same time as an increasingly widened employment base as the period was one of active development in the region due to oil and gas exploration, establishment of the Territorial Government and the expansion of the transportation systems. This is analogous to the increased demands for social assistance during the same period.

A large percentage of crime in the region is related to alcohol abuse and its attendant social problems. Professionals in the field estimate that 90% of all Northwest Territories Ordinance violations are against the Liquor Ordinance, and that alcohol is a factor in 50% of all crime.

Recognizing the apparent relationship between crime rates and development in the region, I have recommended to Foothills ways which may minimize some adverse influences resulting from the project.

49. Q. What were those recommendations?

- A. (1) Pipeline construction workers should be housed in self-contained camps, well removed from communities.
- (2) All access to and from construction camps should be controlled by Foothills.
- (3) Accessibility to construction camps and right-of-way should be open to the R.C.M.P. and/or other peace officers, pursuant to their responsibilities.
- (4) Working facilities should be provided in major construction camps for the R.C.M.P. and/or other peace officers, pursuant to their responsibilities.
- (5) On-going consultation should be maintained with agencies responsible for maintaining the peace.

50. Q. What was your rationale for these recommendations?

- A. The first two recommendations that I have made in this area have a common reasoning behind them because of their very close inter-relationship. Primarily, these recommendations are a direct response to the wishes and demands that have been expressed by many citizens of the Northwest Territories on numerous occasions, some of those being at the community hearings and on my own visits to various settlements and towns throughout the Mackenzie District during the past years.

The remainder of the recommendations in this area stem primarily from my own and other persons' reactions to situations that have occurred in Alaska. Granted,

- (b) Health - Available to those who are unable to maintain themselves due to advanced age, physical or mental disabilities, or dependents of a hospitalized provider.
- (c) Dependent Children - Available to single parents who maintain minor children or in some cases where grown children have assumed responsibility for parents.
- (d) Supplementary Income - Available to those who receive pensions for old age, disabilities or blindness, women whose husbands are incarcerated and some cases where earned income is insufficient to support a family.

There is little doubt in the minds of professional social workers or the man on the street that over the past decade, social assistance has become either a permanent or temporary way of life for a considerable number of northerners. Recipients of social assistance can be classified into two categories.

- (a) The unemployables - those who cannot work or trap because of old age, poor mental or physical health, and mothers with dependent children.
- (b) The employables - those who are physically and mentally capable of working for wages or hunting and trapping but choose not to, or those who cannot find suitable employment.

53. Q. Would you please outline the relationship between the pace of development and level of social assistance?

- A. Development of any sort implies change, whether the development is economic, political or social. Canadian society has long acknowledged the fact that Canadians who are affected by change may require some form of assistance in order to adjust. Therefore, I do not find it surprising that forecasts call for an increase in social assistance payments at least in the short term.

There is a fairly common misconception that social assistance payments will decrease with the increasing availability of jobs and higher incomes. However, if we consider social assistance in terms of payments for reasons of economic need, health, dependent children, or supplementary requirements, data shows that the overall social assistance bill for the impact region has increased on the average from \$841,231.00 to \$2,481,666.00 or 295% over the period 1969/70 to 1974/75. This increase in payments has occurred concurrently with significant increases in the employment base, including buildup of government personnel, introduction of petroleum exploration activity and construction of the Mackenzie, Liard and Dempster Highways.

However, despite the apparent association of increased waged employment activity with increased social assistance requirements, it is not possible to correlate these elements statistically. The total social assistance bill for the impact region may have increased for any one or several of the following reasons:

- (1) Increased payment schedules due to higher cost of living;

- (2) Increased coverage of the region by government social development personnel, both in the scope of the area serviced and in the intensity of services provided;
- (3) The change in human settlement patterns implied in the transition from a land based hunting and gathering economy to a town-centered, wage employment economy;
- (4) Increased family unit breakdown and associated problems which may occur when one or more members of the family are employed away from home for long periods; and,
- (5) The sociological phenomena known as the revolution of rising expectations.

54. Q. What recommendations have been made regarding policy formation that could affect social assistance in the Northwest Territories?

A. Normally, social assistance is beyond the scope and control of Foothills or any developer and is largely the responsibility of governments, community agencies, and most of all, the people themselves. However, there are recommendations which I have made and which Foothills has adopted which may help to reduce the impact of the proposed development. These recommendations are:

- (a) Foothills should make provisions that would enable families in northern settlements to receive money directly while the wage earner is "out on the line".

(b) Foothills should, in conjunction with other agencies, undertake financial counselling and education programmes for employees so that they may be aware of the consumption and savings options open to them in the sparsely serviced North.

55. Q. Why did you make these particular recommendations?

A. Northern workers on the construction project could be away from their homes for long periods and might, for several reasons, not send money home to their families on a regular basis. If the proposed financial counselling and mechanisms for sending money home are utilized, then the need for social assistance in the communities should not be as great as it might be without these preventative mechanisms.

In many cases in the past, money earned by northerners has been spent, squandered, and in some instances stolen. It is my belief that, with some form of financial counselling, a more responsible pattern of money management may emerge in the North.

Such a shift in attitudes and behaviour can only help northerners who opt for wage employment realize their aspirations in the long-term. In my opinion, if the shift occurs, it will help to moderate the increasing trend in social assistance payments.

56. Q. Ms. Jensen, would you now speak to the question of the impact of the proposed pipeline project on social assistance in the Northwest Territories?

A. The impact of the pipeline project on the incidence

and need for social assistance is difficult to assess at this time. In the short-term, I anticipate that social assistance payments will continue to increase. The rate of increase will, in my opinion, be at least as great as the present rate.

Over the long-term, I would also expect that the expansion of a stable employment base by pipeline and related developments along with vocational training programmes should alleviate some of the circumstances and conditions which are reflected in the need for social assistance payments.

57. Q. The Alyeska oil pipeline is presently under construction in Alaska. Would you care to comment on why a direct comparison of the socio-economic impact of this project to that of the Foothills' project is not totally valid?

A. Yes, I would. Although I do not consider myself to be an expert on the socio-economic situation in Alaska and I do not intend to attempt a comparison between Alaska and the Mackenzie Valley, I can list several important factors where the Foothills' project is quite different from the Alyeska project and can therefore be expected to have quite different socio-economic effects.

(1) On the Foothills' project, the peak employment will be approximately 6,000 workers as compared to the 20,000 peak workers on the Alyeska project. With fewer workers, there is much less possibility of social and economic disruption.

(2) For the Foothills' project, all the mainline pipeline and compressor station crews will be housed

in camps remote from the communities. In contrast many of the Alaskan workers have access to the communities from the camps.

- (3) There is no need for extensive terminal facilities in the Northwest Territories whereas the Valdez terminal in Alaska is a major undertaking with considerable socio-economic effect on the community of Valdez.
- (4) For the Foothills' project, the majority of southern workers will be hired in Edmonton or Vancouver and will be returned to these cities when they are finished working. In Alaska, most of the hiring is done in Anchorage and Fairbanks with resultant social problems created by an influx of people seeking employment.

For these reasons I believe the Foothills' project will have considerably less social and economic impact on the Mackenzie Valley region than the Alyeska oil pipeline project has had on Alaska.

58. Q. Mr. Burrell, in recent months, there has been much said about the provision of natural gas to northern communities. Would you please state the Foothills Pipe Lines Ltd. position on this matter and the rationale for such a position?

A. Mr. Blair, our company president covered this matter in his appearance before this inquiry in August of last year (transcript pages 7937-7942, 8241-8243, and 8288-8293). Since that was some time ago and the matter is of such interest, perhaps it bears repeating.

It is our company's firm conviction that whenever it is practicable to do so, residents of an area must be afforded the opportunity and assistance to gain access to and benefit from the resources which are developed within their area, even if it means that special arrangements must be made in order for this to occur.

Consequently, we believe that a natural gas pipeline through the Northwest Territories should do more than transport natural gas from the supply fields of the Beaufort Basin to market areas which are south of the 60th Parallel. Foothills, therefore, has developed a plan for providing natural gas service to northern communities and has included as an integral part of its system, under application to both the Department of Indian Affairs and Northern Development and the National Energy Board, those transmission lateral facilities necessary to deliver natural gas to the "town gate" of a list of principal communities and settlements in the Mackenzie Valley and the Great

Slave Lake area. Our applications then are as much a proposal to deliver natural gas to northern communities as they are a proposal to deliver gas to market areas south of the 60th Parallel.

59. Q. Does Foothills intend to follow the "Traditional Utility Approach" in determining the cost of delivering natural gas to the northern communities?

A. No. If the "Traditional Utility Approach" were to be followed, the resulting cost of the natural gas would be such that in only a few of the communities would it be economically feasible for the residents to enjoy the benefits which can be realized with natural gas service. Foothills does not believe that the "Traditional Utility Approach" should deny the northern people the opportunity of natural gas service -- natural gas which is produced from supply fields located in the Northwest Territories.

60. Q. What policy position or plan then has Foothills developed in order that natural gas service can be made available to a number of the Northwest Territories communities on an economically feasible basis?

A. Specifically, the Foothills' plan for providing gas to northern communities calls for the cost of transporting gas to the "town gate" of each community to be:

- (a) the actual cost of transportation, or
 - (b) the price to be charged by Foothills for gas which it delivers to connecting pipelines at the Northwest Territories/Alberta border --
- whichever of the two is the lesser.

In other words, under the Foothills' plan, the cost of gas delivered to the "town gate" of any of the communities will not exceed the cost of gas which is delivered to the 60th Parallel.

This arrangement will apply only to gas used for residential or commercial purposes and for gas used in the generation of electricity to service these two categories of customers.

61. Q. I note the industry category of customer has been excluded. Why is this?

A. The Foothills' plan for providing natural gas to northern communities is directed primarily towards reducing the fuel costs of residential and commercial customers. However, since the transmission lateral facilities which Foothills proposes to install will have capacity in excess of that forecasted for residential and commercial purposes and to the extent that spare capacity is available, Foothills proposes to offer natural gas for use by industrial consumers at "town gate" costs similar to those for residential and commercial customers. This offer is to be made on the understanding that future residential and commercial customers will have first priority on such spare capacity and, as such, this may cause a later reduction in the quantity of natural gas which can be delivered through the original laterals for industrial consumption. If, in order to supply natural gas to industrial customers, Foothills is required to expand the transmission lateral facilities which were initially installed, Foothills proposes that at the time of construction of the additional facilities it will set a "town gate" rate structure for natural gas to be used by industrial customers which will compensate

Foothills in an appropriate manner for the cost of constructing and operating the additional facilities.

62. Q. Under the Foothills' plan, there must be a number of communities which could receive natural gas service at a cost which would be lower than that which would be calculated using the so called "Traditional Utility Approach"?

A. Yes, there would be.

63. Q. How then, does the Foothills' plan contemplate recovering any cost differential which would result between actual revenue received and the revenue which would have been generated using the "Traditional Utility Approach"?

A. The Foothills' plan calls for the higher unit costs of delivering small quantities of gas to northern users to be rolled in with the cost of delivering the much larger volumes of natural gas to downstream users, a principle which is not unique in the Canadian gas industry. TransCanada PipeLine, for example, uses a zone costing arrangement in Ontario and Quebec where the "town gate" rate structure is the same for the smaller communities as it is for Toronto, Ottawa and Montreal.

64. Q. In determining the practicability of providing natural gas to northern communities, how many communities were examined?

A. We investigated the possibility of providing natural gas service to 24 northern communities.

65. Q. Of the 24 communities, how many did you determine could be practicably provided with natural gas under the Foothills' plan?

A. Eleven communities. It is interesting to note that these eleven communities presently contain approximately 22,000 people which is about 50% of the total population of the Northwest Territories or about 75% of the population of the impact region.

Despite our 'selection' of the communities to be so served, we point out that individual communities in the region would have the option to decide on whether or not they wished gas service and therefore whether or not a pipeline lateral would be built to the community at the same time as mainline construction. Individually, the Slave Lake communities would not necessarily have the same option because the economics of these laterals are very much dependent on which of the Slave communities opt for gas service.

66. Q. How did you determine those communities for which it would be practicable to provide natural gas service under the Foothills' plan?

A. We followed the approach generally used in the utility business and established as a matter of policy the level of capital investment which we could reasonably make towards the installation of each of the community laterals. Our investment policy was established on a unit of throughput basis and for each community lateral system amounts to 25 dollars/MCF of annual throughput as forecasted for the fifth operating year. We concluded that this would enable natural gas to be made available to northerners at a reasonable price while not adding unduly to the mainline transportation cost.

Those communities requiring a capital investment for transmission lateral facilities less than 25 dollars/MCF of annual throughput in the fifth operating year could receive natural gas service under the Foothills' plan without the need to make a capital contribution towards the cost of constructing the transmission lateral facilities. Those communities requiring a capital investment for transmission lateral facilities over 25 dollars/MCF of annual throughput could also receive natural gas service providing a capital contribution was made to cover the amount in excess of the 25 dollars/MCF of annual throughput as forecasted for the fifth operating year. For the purpose of our application only, we deemed it practicable to provide natural gas service to those northern communities which fall into the first category.

67. Q. Does this mean that any community in the region could receive natural gas service under the Foothills' plan?
- A. Yes, if the community themselves decided it is in their best interests to do so; although some may be required to make a capital contribution towards the cost of constructing the transmission lateral facilities.
68. Q. Will you please describe the transmission lateral system which Foothills has included in its applications to the Department of Indian Affairs and Northern Development and to the National Energy Board?
- A. As shown in Figure VIII of the Appendix, the proposed transmission lateral system will consist of approximately 460 miles of pipeline ranging in size from 3" to 10" in diameter, will have an estimated installed cost of 74 million dollars and as I have said before,

will provide natural gas service to about 50% of the population of the Northwest Territories. Although the earliest in-service date for the Foothills' system will probably be 1981 or 1982, all costs stated in this evidence pertain to a 1979 in-service date. It was necessary to do this because costing data for the former in-service dates have not yet been finalized. Comparison of costs for a later start up date, however, should not alter the conclusions which can be drawn from the evidence as presented.

It is proposed that the communities of

Inuvik
Fort Good Hope
Norman Wells
Fort Norman
Wrigley
Fort Simpson
Hay River
Pine Point
Fort Providence
Rae-Edzo, and
Yellowknife

will receive natural gas service with first deliveries occurring in the year after that in which the mainline is put into service. The bulk of the construction of the transmission laterals will occur the year after construction of the mainline is completed, thus providing one more year of pipeline construction employment opportunities for northerners.

69. Q. Who performed the design and cost estimating for the Foothills "Gas to Northern Communities Program"?

A. The design and costing for the transmission laterals were performed by the Foothills Engineering Department. As for the distribution systems, we felt it

important that the required work be performed by experts in that particular field. This work was done for us by Great Northern Gas Utilities Ltd., a company well established in the natural gas distribution business in Canada. Great Northern, its associated companies and its predecessor companies have, for some 27 years, designed, constructed and operated a number of natural gas and propane vapour distribution systems in Western Canada. In addition, Plains Western Gas and Electricity Co. Ltd. (a subsidiary company of Great Northern) is familiar with northern construction and operations, having built and now operating the electrical distribution system in Yellowknife which it has owned and operated for more than 25 years. Great Northern, after conducting on-site load surveys in a number of communities, provided to us by community the forecasted gas volumes, numbers of customers, distribution system capital and operating costs, and equipment conversion costs.

70. Q. Does Foothills intend to own and operate the community distribution systems?

A. No, not unless it is absolutely necessary in order for a community to get natural gas service. Our business is natural gas transmission. In addition, we believe this provides a good business opportunity for a northern firm, perhaps a community co-operative or a natural gas distribution company.

71. Q. What benefits will northern natural gas consumers realize under the Foothills' plan?

A. We estimate that by the mid-1980's, the average annual saving per northern household will exceed 500 dollars when compared to the cost of purchasing fuel oil, not to mention the intangible benefits such as

cleanliness, convenience, and versatility of use which natural gas offers. Table IX of the Appendix shows the forecasted savings expected by household by community.

72. Q. In response to a previous question, you stated that the higher unit costs of delivering the small quantities of gas to northern users would be rolled in with the cost of delivering the much larger volumes of natural gas to downstream users. What is the effect on the mainline cost of service of doing this?

A. We have estimated that in the mid-1980's, this will add 11 to 12 million dollars to the mainline cost of service which is then estimated to be approximately 440 million dollars. The effect will be an increase of less than $1\frac{1}{2}\text{¢}/\text{MCF}$ in the cost of delivering natural gas from the Beaufort Basin to market areas in southern Canada. We believe this is not an unreasonable cost for the opportunity to connect this region's gas reserves with the market areas in the South.

I might add that more detail with respect to this and other questions is contained in a response to a request made by Commission Counsel for additional information regarding the Foothills' plan to provide natural gas service to certain northern communities and which was filed as Exhibit #226 to this Inquiry.

73. Q. Some people have suggested that perhaps it would be more desirable economically not to build the transmission lateral systems but instead channel the funds required to build these lateral systems towards reducing the cost of fuel oil in these communities. Have you any comments on this?

A. Yes. Our estimates show it will be more desirable economically to supply the selected communities with natural gas. In the mid-1980's, for example, for the eleven northern communities cited, the saving using natural gas rather than fuel oil equates to the 11 to 12 million dollar increase in the mainline cost of service which results because of the Gas to Northern Communities Program. By the end of the decade, this annual saving to northern gas consumers is 5 to 6 million dollars more than the added cost to the mainline cost of service which results due to the Gas to Northern Communities Program. Table X of the Appendix shows these results.

One very important consideration in the Gas to Northern Communities Program is that once the pipeline is installed, the cost of transporting natural gas through it remains relatively constant or even reduces. There is no such guarantee with oil deliveries, given the present methods of transportation.

74. Q. Some people have also suggested that since the majority of the people in the North presently have the cost of their fuel subsidized in one way or another, there is really no advantage in converting to natural gas. Could you comment on this?

A. First of all, people owning their own homes and commercial establishments don't receive a fuel subsidy. There will therefore be a definite economic incentive for these users to convert to natural gas service. Reduced operating costs for commercial establishments could also reflect in the cost of goods.

Those that do receive fuel subsidies generally live in government provided housing. Since the government

owns the housing and also provides the fuel subsidy, there certainly will be economic incentives for the government to convert their houses to natural gas. The resulting savings might then be directed to other areas. Overall advantages of natural gas are the added conveniences which it provides its users. In addition, in those communities in which electricity is generated thermally, conversion to natural gas as the generating fuel could result in lower electrical costs to the consumer.

75. Q. Are there any other advantages which natural gas services can provide?

A. Yes, a spin-off benefit from the utilization of natural gas would be that, to the extent the Norman Wells refinery fuel oil production was reduced, the resulting capacity which became available could be used to increase the output of other refinery products that otherwise would be brought in from the South at higher cost.

76. Q. One last question on the Gas to Northern Communities Program; how much natural gas will be consumed in these northern communities?

A. Not that large a volume. At the end of the 1980's, for example, for the eleven communities for which natural gas service is proposed, it is estimated the average daily consumption will be 16.8 MMCF or approximately 0.7% of the mainline throughput.

77. Q. Mr. Burrell, what policy positions has Foothills taken which could have an effect on personnel and community income?

A. Firstly, we believe some means and incentive should be offered to our permanent employees to enable them to extend the benefits of their salaried employment over a greater span of time.

We intend to offer this means and incentive:

- (1) through our permanent employee benefits program which, as presently contemplated, will include a savings plan, pension plan, life insurance and disability protection, all to be financed jointly by the employee and the company.
- (2) We are also prepared to provide money management advice as part of our overall counselling services to those of our operations staff who desire it.

Secondly, since the proposed Foothills' pipeline system is located entirely within the Northwest Territories, we believe encouragement should be given to residents of this area to invest in our project and thus have a say in how the company should function. To accomplish this, we intend to give residents of the Northwest Territories the opportunity to purchase equity ownership in our pipeline project on attractive terms.

78. Q. Mr. Burrell, what policy positions has Foothills taken which could affect community infrastructure?

- A. As a matter of policy, our company will work closely with the communities in order to avoid the overtaxing of infrastructure and will assist in the upgrading of existing facilities should our project make this necessary in the short-term.

In the long-term we would expect the added taxes generated by our project would be made available for continued infrastructure improvement.

In addition, following the construction phase, there will be considerable surplus materials available for disposal and we believe the people within the impact region should have the "right of first refusal" with respect to this equipment and material. Arrangements for the disposal of surplus equipment and materials will be co-ordinated with the appropriate governmental agencies.

There are certain surplus facilities which may be of value to the community as a whole, i.e., packaged water and sewage treatment facilities, first-aid facilities, sleeping and dining facilities, wash house facilities, and camp recreational facilities.

Foothills is prepared to make such surplus facilities available for use by the communities.

79. Q. Mr. MacLeod, have you considered the potential impact of substantial increases in incomes in the corridor communities?

A. Yes. The participation of northerners in pipeline development will undoubtedly result in a proportionate and probably significant injection of revenues into the valley communities. Moreover, this infusion should be both more substantial and more widely based than in previous periods of development in the Territories, mainly because of the greater number of employment and entrepreneurial opportunities and the prospects of their greater sustainability.

Consequently, one can expect the creation of substantial "surplus" income and/or an increase in outlays for current consumption in the communities, assuming the continuation of existing expenditure patterns.

In this respect, we have noted considerable emphasis on current consumption, accompanied by a low rate of saving. The ultimate disposition of these increased incomes presents much potential for either positive or negative impact at both the personal and community level. Although the Applicant's responsibility and authority in this area is limited, some measures should be adopted in order to stimulate positive durable development at the community level.

80. Q. Would you briefly assess the policies that the Applicant adopted in view of creating positive impact in this area?

- A. A higher level of saving or reduction of personal debt accompanied by a decrease in the proportion of disposable income allocated to current expenditures should enable northerners to assume a greater role in the overall economic development of the North and facilitate the fulfillment of individual aspirations, the latter encompassing the accumulation of durable assets.

The Applicant's jointly financed employee benefit plan is essentially a form of forced savings on lucrative terms. I consider this initiative to be advantageous to northerners and it is particularly significant since the provision of such packages is much less prevalent in the Northwest Territories than in southern Canada. I would also add that equity ownership in the pipeline should constitute an additional and rewarding alternate savings instrument.

The Applicant's position with respect to the co-ordination of payroll and employment policies with local financial institutions and the willingness to provide financial counselling will tend to modify existing personal expenditure patterns in accordance with the long-term objective which I have just suggested.

81. Q. Wouldn't the generally higher level of incomes in the communities automatically entail a rise in the standard of living of local residents?

- A. The definition of "higher standard of living" is very subjective. If we assume that the quality of housing and closely related public services are valid components of this definition, I would have to say that improvements will certainly not be automatic as long as the initiative to upgrade these elements of the infra-

structure remains with the public sector and non-resident property owners. The same reasoning is also applicable to recreational facilities.

As a result of pipeline related employment, an increase in personal disposable incomes can be expected and will provide individuals with the resources necessary to upgrade their living conditions. However, the ultimate allocation of these resources and the greatest potential for change lie within the range of individual initiative and responsibility. I think that the Applicant's policy with respect to home ownership will assist in the modification of attitudes in this area.

82. Q. Are there other means whereby the projected incremental revenue flows could create long lasting benefits in the communities?

A. Yes. Economic development at the community level is a well justified concern of northern native organizations.

Commercial services and recreational facilities are very limited in the settlements and represent entrepreneurial opportunities which should best be taken by local residents. I believe that some persons are willing to take the initiative to exploit such opportunities but many small established businessmen and potential entrepreneurs report difficulty in obtaining sufficient financing, particularly with respect to working capital. At the same time, financial institutions are generally absent in many of the settlements. Accordingly, the reconciliation of these needs will involve the pooling of revenues generated by hydrocarbon development.

Although this exceeds the limits of the Applicant's responsibility, it is deemed desirable that some action be taken by native organizations, possibly with the co-operation of government, to create some kind of savings and loan institution in those places where a commercial banking institution would not be viable. Initially, such a facility could operate out of settlement offices and, as managerial skills and the volume of transactions increase, integration into the credit union movement or evolution toward a system similar to that of the Alberta Treasury Branches might be desirable. The success of any such undertaking would depend largely upon the extent of local initiative, responsibility and sustained involvement. The resulting local capital pools would then provide additional means to achieve secondary economic development.

83. Q. In addition to the mobilization of pipeline generated incomes to attain economic development in the settlements, what other potential impact of increased employment opportunities and incomes can you envisage?

A. As one moves from the southern to the northern end of the impact area, it would appear that, without other income, wildlife resources in the immediate vicinity of the communities are becoming insufficient to support a growing percentage of the population. Toward the northern extremity of the study region and points beyond, we note that many natives still live almost exclusively off the land while the rate of participation in wage employment in the same areas continue to increase. Since these people appear reluctant to relinquish their role in providing for their own material needs, one can conclude that, in the absence of additional wage employment opportunities, more people will have to rely upon hunting and trapping.

Furthermore, because of demographic growth, there exists the real possibility of relative depletion of the wildlife.

Pipeline development will generate more wage employment opportunities to accommodate the rising participation rate and thereby allow some people to adopt wage employment should they so desire. Those who choose to remain on the land would therefore be less numerous and be able to pursue their traditional activities on a feasible basis.

While it is my belief that the majority of the northern work force will opt for at least construction employment, leaving little time, energy, manpower, or economic necessity for northerners to pursue traditional economic activities, there are particular variables which should partially offset the expected trend. These variables are:

- (1) Northern preference for food from the land as opposed to food from the Bay or Co-op.
- (2) Dependence and preference of craft producers on local furs and hides to meet family and tourist demands for traditional artifacts.
- (3) Increasing world demand for wild furs which has given rise to record auction prices being paid this winter at the fur auctions for specific northern species.
- (4) Hunting, trapping and fishing are intrinsic in northern peoples perception of themselves as being a separate, distinct group of people and necessary to maintain their own unique culture.

84. Q. Mr. MacLeod, in the preparation of the Foothills' socio-economic impact statement, you have had the responsibility of forecasting fiscal impact. Would you please define the scope of your analysis?

A. I have attempted to quantify the fiscal revenue streams and identify potential areas of increased demand on fiscal resources resulting from the construction and operation of the proposed integrated hydrocarbon development comprising the gas pipeline, gas plants and field development activities.

85. Q. Have you made any changes to your original projections?

A. Yes. I have revised the basis of my royalty projections and can now provide an estimate of corporate income taxes payable by the Applicant.

As I noted in the impact statement, the provisions for taxing many aspects of the integrated hydrocarbon development had not been finalized as of the time of writing and this state of affairs has not improved significantly since the spring of 1975.

86. Q. Would you mind outlining the basis of your revised royalty projections?

A. The two variables which have been modified are the projected wellhead price of gas and the royalty rates applicable to production.

In the original estimates, a wellhead price of \$0.60/MCF was used. We adopted this very low price simply for

illustrative purposes.

In the revised projections, I have used more realistic prices which resulted from a comprehensive study of fuel prices prepared by other consultants retained by the Applicant, the conclusions of which appear in Part 5, Section A of the present Application. As a result of using these escalating prices, anticipated royalty revenues are about 50% higher than my original estimate for the first year and the divergence of the two series of projection increases rapidly over the time period under consideration.

The Federal Government has recently proposed a new royalty scheme applicable to northern gas and oil. According to this proposal, royalties would be comprised of two components: a minimum base rate of 10% levied on production plus a second amount, the progressive incremental royalty (PIR), which would be a function of the profitability of specific fields. Since I do not as yet possess sufficient data to calculate the profit related component, I have developed figures for three production related rates: 10%, 12.5% and 15%. These percentages would correspond to a base rate of 10% plus a second component equal to 0%, 2.5% and 5% of production, respectively. In the appendix to the proposed regulations, it is suggested that Delta production would be of medium profitability and from this I conclude that profits would be high enough for the provisions of the PIR to be operative. The two base rates in excess of 10% may therefore give a rough idea of the effect of additional royalty payments as production increases, assuming, of course, that the latter will entail increases in profitability. The resulting estimates appear in the Appendix of this testimony as Table XI.

I would like to point out that the project plan calls for the attainment of maximum anticipated throughput by the sixth year. Minimum royalties of 10% would probably be applicable to the limited production of the earlier years while the PIR would likely become operative by the sixth year, if not sooner.

87. Q. You have suggested that royalties would be levied on production rather than on throughput. Is this distinction intentional?

A. Yes, I would stress that royalties are based essentially on production and I have no reason to believe that this approach would differ in the Territories. However, one would expect production to more or less equal throughput and I suppose that the resulting equivalent figures could give rise to some confusion. There are two major conclusions that can be drawn from this distinction.

Firstly, it will be the producing companies and not the Applicant who will be subject to these royalty payments.

Secondly, and this is far more important, royalty revenues to Canadian governments would not be greater should a larger pipe be built to transport gas produced in other jurisdictions, such as Alaska, in addition to Delta production.

88. Q. Since the Applicant will not be paying royalties, will the pipeline company's contribution to government revenues be limited to normal corporate income taxes?

A. No, not at all.

In my original submission, I mentioned a variety of taxes which the Applicant would be required to pay to the local, Territorial and Federal governments.

In addition to corporate income taxes, the Applicant will also be subject to quarrying fees, which will primarily benefit the local governments which possess taxing powers, and the territorial fuel tax, all of which have been estimated in the impact statement filed in May of 1975.

Also, no specific right-of-way lease proposal has been made but I suspect that it will likely involve substantial payments. I also think that this eventual agreement will probably incorporate some of the specific taxes which I outlined in the impact statement, particularly stumpage fees and right-of-way taxes. The Territorial and Federal governments both have their own provisions for taxing similar activities, although neither have all encompassing legislation. Ultimately, these lease payments will probably be payable to the owners of the land. The land ownership issue is, of course, still to be resolved.

89. Q. Considering the capital intensive nature of the hydrocarbon industry, would not the most important tax payable by the Applicant, namely corporate income tax, be indefinitely deferred and therefore not contribute to the positive fiscal impact?

A. In the absence of any unforeseen additional capital expenditures, the Applicant would start paying income taxes by the fourth year of operations and by the sixth year would commence paying taxes which were deferred during the first three years. These pro-

jections appear on Table XII in the Appendix.

It might be argued that pipeline companies operating in southern Canada have succeeded in deferring much of their income taxes by continuously undertaking capital expansion programs. There is generally much scope and frequent necessity to loop segments of such systems since they all typically involve numerous gas gathering and delivery points. In other words, increased supply and/or demand in parts of the system will occasion partial looping to increase the capacity of the affected segments of the system, while leaving the capacity of the remaining portions constant.

Since the Applicant's proposal does not provide for the operation of gathering systems and will deliver most of the throughput to another carrier at the southern extremity of the Mackenzie Valley pipeline, the only possible significant capital expansion would involve the looping of the entire system to the 60th Parallel. Such an undertaking is not envisaged at the present time. Similarly, the possibility of looping the much smaller community gas laterals is also remote in view of their planned initial capacity and prospects for future growth in demand. The effect of other potential expansion projects, such as increasing the capacity of compressor stations, should not significantly alter the tax position of the Applicant in the foreseeable future.

Finally, I would like to stress that the projected tax deferrals of the early years, and any others which might arise, will be credited to the customers of the Applicant and thereby reduce the selling price of the gas. These credits would be recovered in later years when the deferral of taxes will cease and become

payable by the Applicant. In no case will these amounts be interest-free loans from the government to the company.

Again, with reference to Table XII, I am of the opinion that projections of income taxes payable by the Applicant carry a high degree of certainty. The Applicant's activities will be relatively straight forward in that its operations will be restricted to being a common carrier solely in the Northwest Territories. Consequently, the sole place of residence for corporate tax purposes will be in the impact region as presently defined.

90. Q. Why have you not prepared a comprehensive table showing the potential revenue streams which could accrue to the three levels of government and possibly to native organizations?

A. Although I have introduced new data in the revised tables, the overall revenue impact remains incomplete and the uncertainties still surrounding the right-of-way leases and the complexities associated with the taxation of producers' profits would only increase the degree of error of all encompassing projections. In the impact statement and in the Appendix, I have presented enough data to allow any interested persons to assemble an overall picture. I think that by forcing the potential analyst to go through this exercise, he will more fully appreciate the extent of incompleteness and the difficulties in obtaining precise estimates.

Secondly, under existing legislation, the most substantial sources of fiscal revenues accrue to the

Federal Government and I do not think that it would be appropriate to view the total fiscal impact in this light because current and pending negotiations between the three levels of government and native organizations are likely to substantially modify the division of these revenues.

91. Q. Could you briefly enumerate the revenue streams which you have been unable to quantify but which will nevertheless contribute to the total fiscal revenue impact?

A. The major deficiencies lie in the area of income taxes.

Firstly, I have decided not to include in my tables the estimate of the income taxes payable by the producer companies. The reason for this is that the gas plants will not, to our knowledge, constitute separate legal entities but will simply be operational facilities of integrated interprovincial corporations. Consequently, production of Delta gas may give rise to taxable income in more than one division of each of the producing companies such that taxes resulting from the production of northern gas will be payable in more than one jurisdiction. Furthermore, the tax position of the various operating divisions of these corporations are interdependent so that, for example, the anticipated operating losses of the first couple of years in the Delta are likely to be used to offset profits earned elsewhere than in the North. Similarly, profits earned in the Delta may also be transferred elsewhere.

Secondly, it is almost impossible to determine the incremental amounts which would be payable by the private businesses in the impact region. I would not venture to make even a wild guess at this time.

Last, but not least, the effect of pipeline development on personal income taxes would be a little less difficult to assess but would still require a major study. The strategic variables in this equation include the extent of participation of northerners in pipeline generated employment and the general increase of wage levels in the Territories resulting from the development proposal. If we could answer these two questions with a high degree of accuracy, a reasonably good projection of personal income taxes could be made in conjunction with other projections made throughout our study.

In general terms, the increment in aggregate personal taxes payable in the Territories will come from the employment of presently idle northerners, and increase in earnings of those already employed and the employment of new residents.

92. Q. What do you think that the overall impact of these fiscal revenues will be on the Territorial Government?
- A. As I indicated in the impact statement, the Territorial administration is highly subsidized by the Federal Government. According to Table XIII in the Appendix, contributions and loans from Ottawa account for a fairly constant 75% of the Territorial Government's budgetary resources, while earned revenue represents only 4.8% of the total.

If we put legislative considerations aside for a moment and consider only the financial flows between the two governments, I think that the potential fiscal revenues resulting from the operation of a natural gas pipeline raise the very real possibility of transforming the chronic territorial deficit, in

terms of this "balance of payments", into a sustainable surplus. Unfortunately, a comparison of these projected revenues with estimates of government expenditures cannot be easily made because of different cost escalation and growth factors.

I have prepared Table XIV in the Appendix, which places fiscal revenues in perspective, in order to facilitate a meaningful comparison. In this new table, I have discounted to present values all the projected fiscal revenue streams, which appear in the two preceding tables, at a rate equal to the sum of the social rate of discount and the Gross National Expenditure price deflator. The hypothesized values attributed to the two components of the overall discount rate are consistent with the values used elsewhere in the present Application and are referenced in the table. The object of this exercise has been to convert future tax revenues, which in the preceding tables were expressed in future, i.e. current, dollar values, into 1975-76 dollars. Consequently, any discounted value appearing in Table XIV might now be compared to Territorial Government budgetary estimates for fiscal 1975-76 which appear in the original Table XIII. However, I think that mature years, in terms of capacity pipeline and gas plant operation would provide more meaningful comparisons; for example, in the first year of capacity operation, the discounted value of the total of royalty payments and the Applicant's income taxes in the Northwest Territories amount to \$111.6 million compared to the total estimated Territorial Government expenditures in 1975-76 of \$164 million.

Ideally, the current amount of direct Federal expenditures of benefit to the residents of the Northwest

Territories, over and above Federal contributions to the Territorial Government, should be added to the figure of \$164 million in order to assess the overall inter-governmental balance of payments effect.

Unfortunately, we have not been able to obtain this data. However, it is probable that the projected gas industry generated incremental revenues which we have not quantified would adequately offset this category of Federal expenditures.

Considering that we have ignored the producer companies' corporate income taxes, incremental income taxes payable by individuals and the non-pipeline private business sector, right-of-way lease payments and the territorial fuel tax, I think that I can conclude that the proposed integrated hydrocarbon development would transform the chronic deficit position of the Territories in its relationship with the Federal Government into a surplus. In other words, aggregate fiscal revenues collected in the Northwest Territories should equal, if not exceed, total public expenditures in that jurisdiction.

In further support of this conclusion, I would add that the potential discounted present value of producer companies' income taxes payable in the first year of capacity production could be in the order of \$130 million. This amount, when added to our estimate of royalties and the Applicant's income taxes would amount to some \$241 million and should be sufficient to cover total public expenditures in the Northwest Territories, including the 1975-76 budget and direct Federal expenditures. Admittedly, this estimate of producers' income taxes, which is based upon work done for the Applicant by DataMetrics Limited and appears in Section 5A of the present application, is fairly tentative due to the

interdependency of the tax position of the various operating centers of the integrated producer companies.

Finally, I would stress again that the preceding discussion is primarily concerned with the intergovernmental balance of payments.

93. Q. For the upcoming fiscal period 1976-77, Territorial Government budgetary estimates are up 26% over the previous year. If government expenditures continue to grow at such a rate, are you sure that hydrocarbon industry generated fiscal revenues will be sufficient to eliminate the chronic deficit position?

A. Probably not. However, I would stress that the current budget and those in the foreseeable future will reflect the continued formation of a government which has only existed since 1967 and the need to upgrade, and in some cases, provide public services for the first time. I do not think that this current high rate of growth of public expenditures can be extrapolated indefinitely into the future.

At the same time, the present values of the projected fiscal revenues, as shown in Table XIV, tend to be understated in that the rate of inflation included in the overall discount rate exceeds some of the rates of cost escalation which were used in the corporate income tax and royalty forecasts.

Briefly then, government revenues are likely to moderate while future revenues may exceed our projections.

94. Q. In the absence of sustained increases in public expenditure by the Government of the Northwest Territories, would hydrocarbon industry induced revenues necessarily eliminate the Territorial Government's chronic deficit position?

A. This would depend upon the eventual conclusion of a revenue sharing agreement with Ottawa. Under present arrangements, all royalties would accrue to the Federal Government as would income taxes collected in the Territories. These will be the sources of the most significant potential increases in government revenues in the Territories.

95. Q. Surely additional public expenditures will have to be incurred in order to reap the revenues which you have projected?

A. Yes. This is certainly true, but I think that the increase in public expenditures necessitated by pipeline development will be moderate in relation to the high rate of increase being incurred at present in the current process of upgrading and expanding the existing infrastructure. Actually, I think that the provision of additional capacity to meet the incremental demand created by development in the course of the general upgrading program should entail lower marginal costs than if new capacity had to be

added to an otherwise satisfactory infrastructure. Overall, I believe that pipeline development will serve as a catalyst in this badly needed upgrading process and will allow it to proceed with minimal encumbrances, rather than impose a significant and costly burden on the existing inadequate infrastructure. I think that views to the contrary are probably pre-dicated on excessively high and unrealistic population projections.

96. Q. Could you specify some of the potential impact areas in terms of incremental cost?

A. In the Federal and Territorial fields of responsibility lie medical services, education, roads, and social services, just to mention the more important.

With respect to the first, I have been informed by the competent authorities that there is probably enough unused capacity in the Inuvik Hospital to meet all the requirements of the entire valley during the construction phase which would also be the period of peak demand. Since the physical plant is more than adequate, the incremental cost would involve the hiring of additional personnel. It is also my understanding that the hospital in Fort Simpson is underutilized due to staff shortages.

Subject to some qualifications, similar conditions exist within the education sector although very little impact should be expected at all during the construction phase. Additional high school classroom capacity will soon be needed in Inuvik and the extension which is already planned for 1977 should be able to meet both current requirements and increased demand generated in

the pipeline operations and maintenance phase.

In Norman Wells, development will necessitate the addition of a couple more classrooms and this need could be met by using portable units, a surplus of which already exists elsewhere in the region.

Educational facilities in Fort Simpson appear adequate, although the eventual need for a high school is occasionally suggested. In general, I think that the arguments for additional capacity in this community are based on excessively high population projections. The capability of the existing school extends to grade 10 and, as the student population gradually shifts from the elementary to the secondary level, the remaining grades may be added by means of a modification of capacity allocation, with or without building extensions, while avoiding the construction of a second school. However, I do not think that the pipeline itself will have much bearing upon this evolutionary process.

Briefly then, the main incremental cost in the education sector will involve the hiring of additional staff.

Throughout the construction phase, extensive use of the highway system will undoubtedly result in much wear and tear and increased maintenance costs. However, I think that much, if not all, of these costs could be offset by the very substantial increases in revenues from vehicle licencing fees and fuel taxes. The increase in the latter alone is estimated to exceed \$4 million in each of the two peak construction years. This is a lot of money to service relatively few miles of road.

Within the vast area of social services, I think that transients represent the greatest potential cost impact. However, for reasons cited earlier, this problem is likely to be a lot less serious here than it has been in Alaska.

97. Q. What about the fiscal impact at the community level?

A. As I have said earlier, most settlements should not be noticeably affected. On the other hand, Inuvik, Norman Wells and Fort Simpson will be relatively high impact centers in both the construction and operations phases. I would also expect increased activity in Hay River, particularly in the construction phase. I do not hesitate to say that while most of the pipeline generated fiscal revenues will accrue to the Territorial and Federal Governments, given existing arrangements, a disproportionately high demand for public services will be at the local government level.

The burden of response to this additional demand and the fiscal capabilities to respond depend upon the category or status of the particular local government. These distinctions have been most adequately described elsewhere, notably by Gemini North Ltd., and few changes have occurred since then, although the Government of the Northwest Territories is gradually increasing the autonomy of local governments. Accordingly, I will avoid needless repetition.

The settlements possess neither taxing powers nor significant spending authority and operate on grants provided by the Territorial Government. Consequently, the limited incremental financial costs which we see for these communities will have to be borne by the

Government of the Northwest Territories.

Norman Wells, a high impact center, is presently a settlement but is likely to become a hamlet in the near future. At that time, it will be able to set its own budget within guidelines established by the Territorial Government and would be able to levy community service charges, permits, licence fees and fines. Further into the future, the increased population which we have projected would enable this community to rise to village status and thereby enlarge its taxing authority to comprise property assessments. Fort Simpson is already a village and its revenue sources and spending authority are similar to that of towns such as Inuvik and Hay River.

98. Q. Could you identify the more important areas of potential cost increases at the municipal level?

A. Yes, but in order to minimize repetition, I would prefer to limit some of my comments on fiscal impact to Inuvik. This will be the highest impact center and also has all of the potential points of repercussion that one might find in Fort Simpson and Norman Wells.

Being a resident of Inuvik, my greater familiarity with current and anticipated problems there should enhance the validity of my observations and conclusions and still permit generalizations applicable to the rest of the valley.

Hydrocarbon industry development can be expected to create significant incremental demand for utilities, road extensions, serviced land and recreational facilities.

Recent discussions with Town of Inuvik officials confirm the view that existing drinking water and sewage system capabilities could easily accommodate the increased demand resulting from the realization of even our maximum population growth projections, with some capacity to spare. Some interest has been expressed from time to time in constructing a sewage treatment plant which, at this time, would cost approximately \$6 million and entail substantial operating costs. At the same time, we note considerable criticism of the Inuvik sewage lagoon, based on its potential for cumulative environmental effects and its undesirability from a social point of view. For these reasons, we are not prepared to rule out the possible eventual need to construct a sewage treatment facility.

The increased demand for public utilities will be reflected mainly in the need to connect new lots to the existing network. The entire cost of trunkline extensions is normally assumed by the Federal Government while lateral lines are financed at the municipal level. This latter responsibility is essentially of an interim nature since amounts expended are recovered in the selling price of the serviced lots.

Street extensions are financed on a 50-50 basis by the Territorial and municipal governments. In principle, the local government ultimately recovers its outlays from both property taxes and in the original selling price of the lots.

The vital link in the capacity to accommodate growth lies in the availability of serviced land. In the Inuvik vicinity, land is plentiful but in most cases, is not immediately usable. The most expensive element

in land servicing is the filling in of the lot with gravel; since the lots requiring the least fill are the least costly, they have rapidly diminished in number such that additional fully serviced land can only be made available at much higher costs. Moreover, it is believed that these costs will become so high as to make property ownership inaccessible to most potential buyers.

Finally, the dire need for additional recreational facilities in most of the valley communities has been stressed on numerous occasions and will be intensified by demographic growth.

Briefly then, it can be concluded that, in general, the local governments in the corridor will require:

- (1) assistance in the interim financing of water and sewage lateral distribution systems and street extensions;
- (2) additional revenues to increase the availability of serviced land in order to restrain the escalation of property costs; and,
- (3) resources to meet the increasing demand for recreational outlets.

There are, of course, other areas of cost impact, such as police and fire protection services, but we believe that the incremental effects will be relatively small since the basic structures are already established.

99. Q. Wouldn't the proposed integrated hydrocarbon development also give rise to incremental revenues at the local levels?

- A. Yes. The two most important sources would be property taxes and quarrying fees.

In the corridor communities, much of the real estate is government owned and includes both civil service and public housing. There are very few private rate payers with the result that the bulk of the revenues of, for example, the Town of Inuvik, come from government grants in lieu of taxes which are determined by negotiation and limit the town's fiscal autonomy. Furthermore, since these grants are not included in the taxable assessment or rate base, the borrowing capacity of the town, with respect to this criteria, is largely determined by the assessment of the limited number of private property owners.

The policy of the Applicant to provide employee housing within the high impact communities during the operations phase will undoubtedly have the effect of increasing the rate base and hence the borrowing capacity of these communities.

Nevertheless, I would like to point out that if the Applicant's home ownership policy is successful, the effect of this policy on property tax revenues in Inuvik would be limited since the town offers a partial tax rebate to all home owner-occupants. Accordingly, the greatest proportion of the increase in property tax revenues would probably be derived from residential property owned by non-occupants and commercial and industrial property.

Since the Applicant will undertake to supply gas to the valley communities, a portion of the lateral lines and all distribution lines will lie within municipal

boundaries and therefore be included in the municipalities' taxable assessment. The magnitude of the fiscal benefits of this factor will depend on whether the distribution of gas will be assumed by private or public corporations.

With respect to the second major potential source of incremental revenue, I noted in the impact statement that in the Inuvik vicinity, quarry management has been transferred to the town and that similar arrangements are envisaged for other towns in the Territories. However, these quarrying fees are a source of both controversy and substantial revenue. The controversy relates to the higher fees (as opposed to previous Territorial rates), the repercussions on the cost of local land fill, and the relative scarcity of this non-renewable resource. There will be a temptation for the municipalities to maximize revenues from this source while, at the same time, they are very conscious to retain sufficient reserves to meet current and future local gravel requirements. Regulations may be required to ensure fulfillment of the second objective.

100. Q. Do you believe that these incremental revenues will at least equal the potential envisaged costs?

A. This is a difficult question to answer and avoids an essential aspect of the problem. The individual municipalities will expand their services to the extent permitted by the additional revenues that I have just described. However, it is most unlikely that the resulting improvements and additions will be consistent, in terms of both quality and quantity, with the magnitude of overall benefits created by development. It is really a matter of equitable sharing of wealth among the three levels of government.

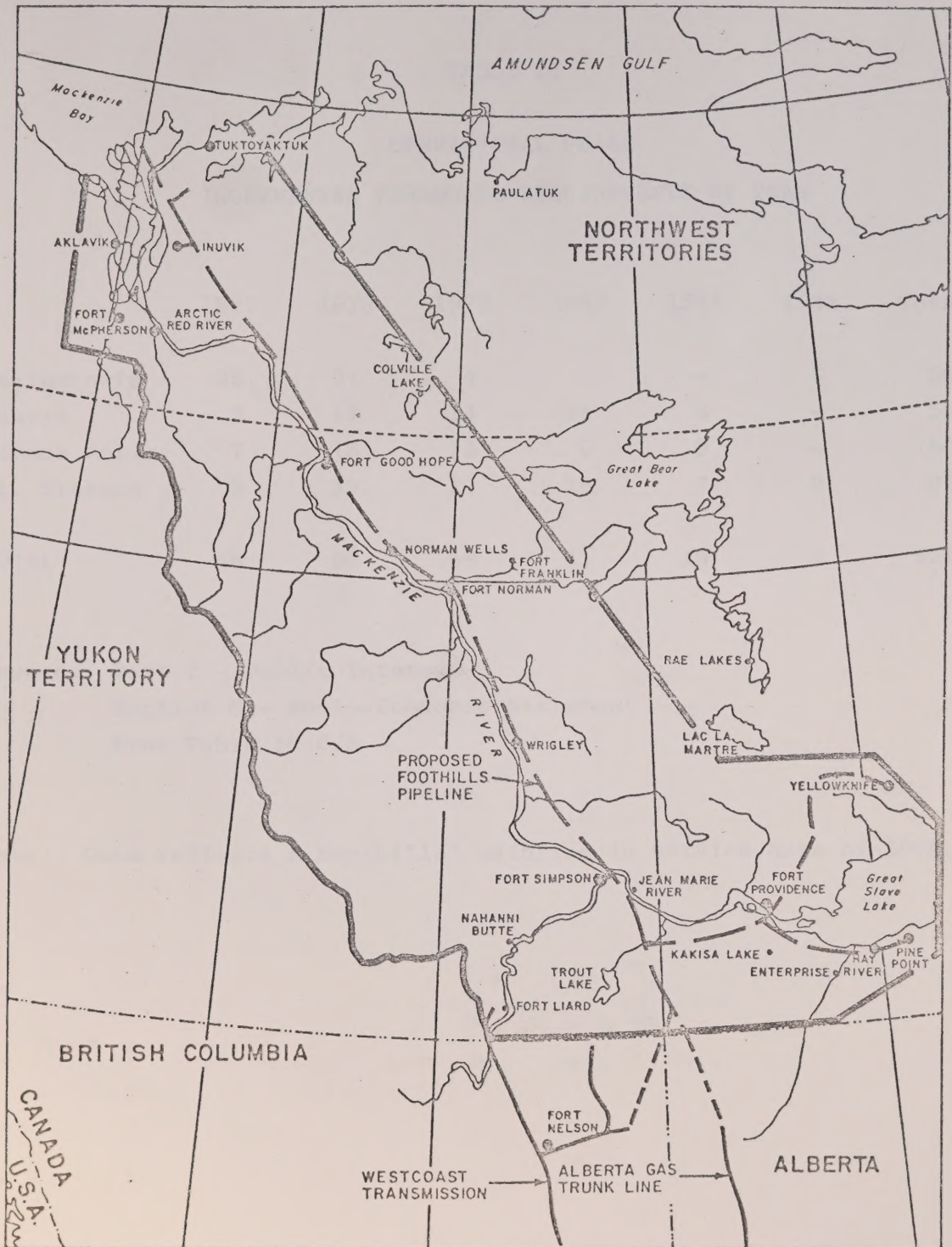
101. Q. Do you have any idea how a more equitable portion of this wealth might be obtained by the municipalities?

A. An approach which has been gaining much popularity in the Delta involves the assessment of physical hydrocarbon industry assets, such as pipelines, compressor stations and gas plants, for property tax purposes by the neighbouring communities which have such taxing authority. This could be accomplished by the extension of existing municipal boundaries or by some revenue sharing agreement with a higher level of government. The underlying philosophy of this approach is that the bulk of the physical assets of the industry will be located outside of the towns in which most of the incremental fiscal costs will be incurred.

FOOTHILLS PIPE LINES LTD.

PANEL ONE OF PHASE IV

APPENDIX TO PREPARED EVIDENCE



LEGEND

- CORRIDOR
- PIPELINE

IMPACT AREA

FIGURE 1

TABLE III
PREDICTED FREQUENCY OF ACCIDENTS

<u>YEAR</u>	<u>MAN YEARS</u> ⁽¹⁾	<u>MAN HOURS</u>	<u>PROJECTED ACCIDENTS</u> ⁽²⁾	<u>PROJECTED HOSPITALIZATION</u> ⁽³⁾
1978	150	432,000	26	5
1979	575	1,656,000	99	17
1980	2,285	6,580,800	394	71
1981	1,833	5,279,040	316	56
1982	175	504,000	30	5
1983	645	1,857,600	111	20
1984	175	504,000	30	5

Footnotes:

- (1) One man-year - 2,880 man hours.
- (2) Assumed rate 60.0 accidents per million man hours.
- (3) Based on 1973 Alberta Pipeline construction data; 18% of accidents required hospitalization.

TABLE IV
NORTHWEST TERRITORIES INFANT MORTALITY RATE
PER 1,000 LIVE BIRTHS
ALL ETHNIC GROUPS

<u>YEAR</u>	<u>N.W.T.</u>	<u>CANADA</u>
1970	65	19
1971	58	
1972	49	N/A
1973	28	N/A
1974	43	N/A

Note:

All figures have been rounded.

Source: Government of Canada, Department of National Health and Welfare, "Report on Health Conditions in the N.W.T.", 1974. Pg. 7.

Table VI

School Enrollment Projections With and Without Development
Foothills Operating Centers, Mackenzie District 1977-1983

Community	1977	1978	1979	1980	1981	1982	1983
Inuvik							
Without Development	1052 ⁽¹⁾	1090	1127	1165	1202	1234	1277
With Development	1286	1422	1667	1732	1797	1848	1901
Norman Wells							
Without Development	114	118	122	126	130	134	138
With Development	153	178	204	215	217	224	228
Fort Simpson							
Without Development	311	322	333	344	355	366	377
With Development	329	353	385	413	428	435	442
Yellowknife							
Without Development	n/a	n/a	n/a	n/a	n/a	n/a	n/a
With Development	2719	2982	3248	3432	3653	3873	4056
Incremental Increase due to Development	291 ⁽²⁾	423	674	725	755	773	779
Annual Growth due to Development	291	132	251	51	30	18	6

Notes: (1) All figures have been rounded

(2) Projected incremental increase does not include Yellowknife

Assumptions: Does not consider school age population from outlying settlements who may attend school in operating centers.

Multiplier of .3 applied to population projections with and without development.

Source: Population Data, Jean B. MacLeod, Economic Consultant, Inuvik, N.W.T.

Table VII

Projected Needs for Additional Classrooms With and Without Development

Mackenzie District		1977-1983					
		Number of Classrooms					
		1977	1978	1979	1980	1981	1982 1983
Elementary							
Without Development	35 ⁽¹⁾	37	38	39	40	42	43
With Development	42	47	54	57	59	60	62
High School							
Without Development	21	22	23	23	24	25	26
With Development	25	28	32	34	35	36	37
Incremental Increase Due to Development	11 ⁽²⁾	16	25	29	30	29	30
Annual Growth Due to Development	11	5	9	4	1	--	1

Notes:

(1) All figures have been rounded

(2) Projected incremental increase does not include Yellowknife

Assumptions:

Ratio 60/40 - Elementary School / High School enrollment

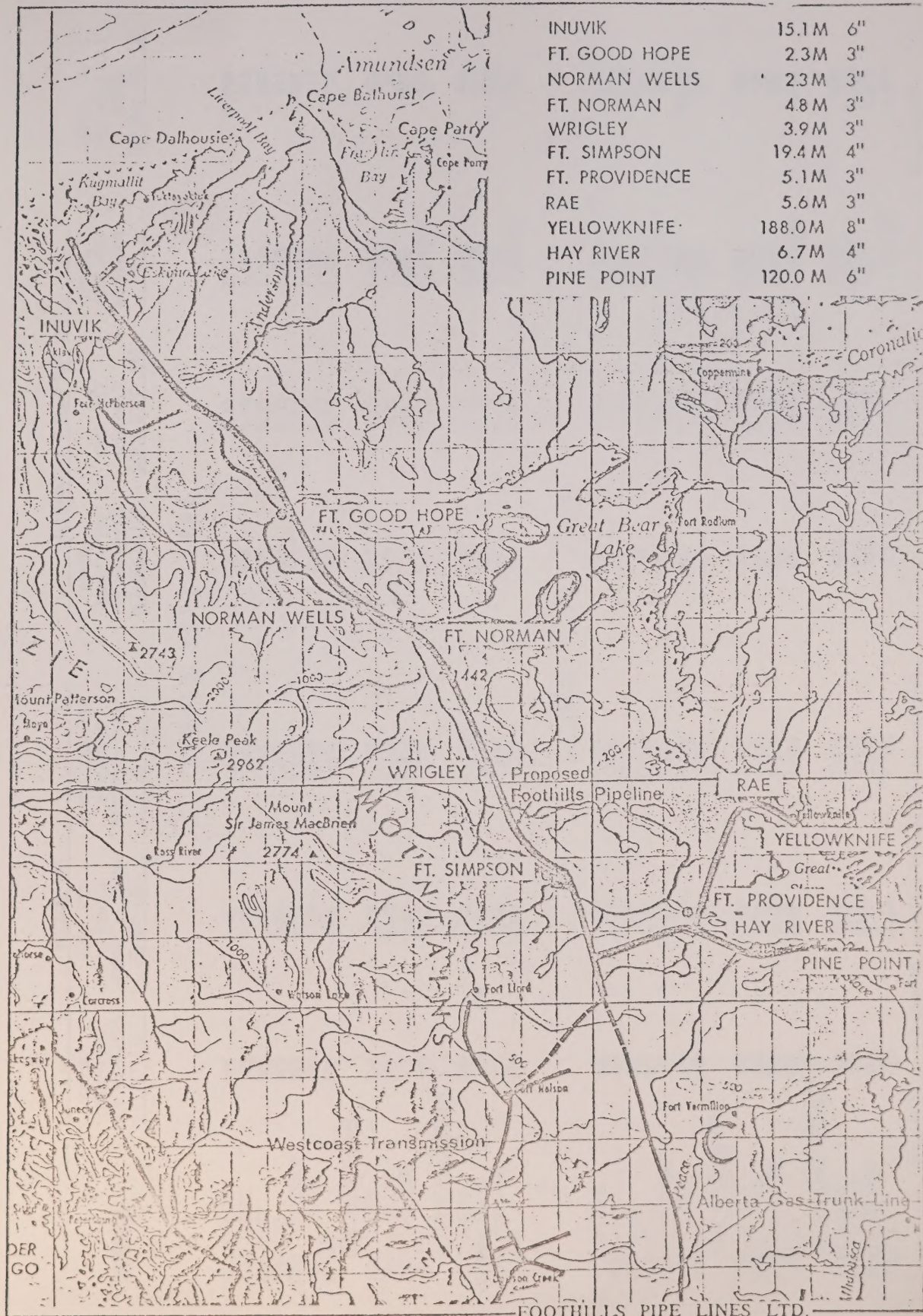
Elementary Grades: 25 students per classroom

High School Grades: 28 students per classroom

Source:

Table VI

COMMUNITIES PROPOSED TO BE SERVICED BY FOOTHILLS PIPE LINES LTD.



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PLAN FOR PROVIDING NATURAL GAS SERVICE TO NORTHERN COMMUNITIES

ESTIMATED ANNUAL SAVINGS PER HOUSEHOLD - NATURAL GAS COMPARED TO FUEL OIL - ALL COMMUNITIES

COMMUNITY	NATURAL GAS			ALTERNATIVE FUEL - FUEL OIL			ANNUAL SAVING PER HOUSEHOLD USING NATURAL GAS (\$)
	ANNUAL CONSUMPTION PER HOUSEHOLD MCF (1)	COST PER HOUSEHOLD -FOOTHILLS PLAN- \$/MCF (2)	ANNUAL COST PER HOUSEHOLD -FOOTHILLS PLAN- \$	ANNUAL CONSUMPTION PER HOUSEHOLD MCF EQUIV. (3)	COST PER HOUSEHOLD \$/MCF EQUIV. (4)	ANNUAL COST PER HOUSEHOLD \$	
S A M P L E Y E A R 1 9 8 5							
YELLOWKNIFE	325	3.42	1,110	374	5.64	2,110	1,000
PINE POINT	325	3.15	1,025	374	5.35	2,000	1,975
HAY RIVER	325	3.07	1,000	374	5.35	2,000	1,000
RAE-EDZO	325	4.33	1,410	374	5.95	2,225	815
FORT PROVIDENCE	325	3.90	1,270	374	5.55	2,075	805
FORT SIMPSON	350	3.78	1,325	403	5.55	2,235	910
WRIGLEY	350	4.65	1,630	403	6.01	2,420	790
BASE FORECAST (5)							
FORT NORMAN	350	4.43	1,550	403	4.82	1,945	395
NORMAN WELLS	350	3.64	1,275	403	3.25	1,310	35
FORT GOOD HOPE	350	4.26	1,490	403	4.90	1,975	485
INUWIK	350	2.44	855	403	4.33	1,745 (6)	890
ALTERNATIVE FORECAST (5)							
FORT NORMAN	350	4.43	1,550	403	5.81	2,340	790
NORMAN WELLS	350	3.64	1,275	403	5.36	2,160	835
FORT GOOD HOPE	350	4.26	1,490	403	5.87	2,365	875
INUWIK	350	2.44	855	403	6.44	2,595 (6)	1,740
S A M P L E Y E A R 1 9 8 9							
YELLOWKNIFE	325	3.75	1,220	374	6.41	2,400	1,180
PINE POINT	325	3.62	1,175	374	6.08	2,275	1,100
HAY RIVER	325	3.41	1,110	374	6.08	2,275	1,165
RAE-EDZO	325	4.82	1,565	374	6.77	2,530	965
FORT PROVIDENCE	325	4.29	1,395	374	6.31	2,360	965
FORT SIMPSON	350	4.22	1,475	403	6.36	2,565	1,090
WRIGLEY	350	5.08	1,780	403	6.84	2,755	975
BASE FORECAST (5)							
FORT NORMAN	350	4.90	1,715	403	5.62	2,265	550
NORMAN WELLS	350	4.13	1,445	403	3.78	1,525	80
FORT GOOD HOPE	350	4.72	1,650	403	5.70	2,300	650
INUWIK	350	2.88	1,010	403	5.04	2,030 (6)	1,020
ALTERNATIVE FORECAST (5)							
FORT NORMAN	350	4.90	1,715	403	6.61	2,665	950
NORMAN WELLS	350	4.13	1,445	403	6.08	2,450	1,005
FORT GOOD HOPE	350	4.72	1,650	403	6.69	2,695	1,045
INUWIK	350	2.88	1,010	403	7.34	2,960 (6)	1,950

Note: Data reflects a Foothills' mainline in service date of 1979.

(Sept. 8/75)

will no longer exist and that the price of fuel oil will probably be allowed to seek its own level. In Foothills' opinion, the more appropriate comparison to be made in determining the savings which can be realized by utilizing natural gas should be based upon the alternative forecast of fuel oil prices. The situation in Norman Wells is more complex. Firstly, there is little economic incentive to convert to natural gas if the former pricing forecast prevails although there are intangible incentives, and secondly, a portion of the community is already being supplied with solution gas from the refinery. It is Foothills' understanding, however, that at present there is some uncertainty as to the extent solution gas will be distributed within the community in the future.

Should the price of fuel oil consumed by residential and commercial customers in Norman Wells not be de-regulated or if the community will be serviced entirely by solution gas or some combination of fuel oil and solution gas, the servicing of Norman Wells with natural gas from Foothills' pipeline system would be unlikely. However, should the above arrangements not materialize, and considering the economic benefits which the residents of Norman Wells could realize, in all likelihood, Norman Wells would then be provided with natural gas.

A spin-off benefit from the utilization of natural gas would be that to the extent the Norman Wells refinery fuel oil production was reduced, the resulting capacity which became available could be used to increase the output of other refinery products which otherwise would be brought in from the South.

6. For a consumer, utilizing fuel oil for heating. A number of the consumers, however, are currently served by the utilidor system.

Table X

PLAN FOR PROVIDING NATURAL GAS SERVICE TO NORTHERN COMMUNITIES
ESTIMATED TOTAL ANNUAL SAVINGS - NATURAL GAS COMPARED TO FUEL OIL - ALL COMMUNITIES

COMMUNITY	ESTIMATED NUMBER OF TOTAL CUSTOMERS	NATURAL GAS			FUEL OIL			TOTAL ANNUAL SAVINGS USING NATURAL GAS \$M
		ANNUAL CONSUMPTION MCMF (1)(3)	COST -FOOTHILLS PLAN- \$/MCF (5)	ANNUAL COST \$M	ANNUAL CONSUMPTION \$/MCF EQUIV. (2)(3)	COST (6) \$/MCF EQUIV.	ESTIMATED ANNUAL COST \$M	
SAMPLE YEAR 1985								
YELLOWKNIFE	3,404	1,788	3.42	6,115	1,888	5.64	10,650	4,535
PINE POINT	697	510	3.15	1,605	517	5.35	2,765	1,160
HAY RIVER	1,304	1,038	3.07	3,185	1,065	5.35	5,700	2,515
RAE-EDZO	533	187	4.33	810	198	5.95	1,180	370
FORT PROVIDENCE	319	156	3.90	610	164	5.55	910	300
FORT SIMPSON	454	278	3.78	1,015	278	5.55	1,560	525
WRIGLEY	69	30	4.65	140	30	6.01	180	40
BASE FORECAST (4)								
FORT NORMAN	115	52	4.43	230	54	4.82	260	30
NORMAN WELLS	174	127	3.64	465	130	3.25	425	--
FORT GOOD HOPE	146	69	4.26	295	72	4.90	355	60
INUVIK	1,014	1,203	2.44	2,935	1,211 (7)	(8)	4,465	1,510
ALTERNATIVE FORECAST (4)								
FORT NORMAN	115	52	4.43	230	54	5.81	315	85
NORMAN WELLS	174	127	3.64	465	130	5.36	700	235
FORT GOOD HOPE	146	69	4.26	295	72	5.87	425	130
INUVIK	1,014	1,203	2.44	2,935	1,211 (7)	(8)	5,350	2,415
EFFECT OF "NATURAL GAS TO NORTHERN COMMUNITIES PLAN" ON MAINLINE TRANSPORTATION COST - \$M								
								12,310
								11,800
								0.014
SAMPLE YEAR 1989								
YELLOWKNIFE	4,012	2,091	3.75	7,840	2,208	6.41	14,155	6,315
PINE POINT	774	535	3.62	1,935	544	6.08	3,310	1,375
HAY RIVER	1,537	1,190	3.41	4,060	1,222	6.08	7,430	3,370
RAE-EDZO	590	207	4.82	1,000	219	6.77	1,485	485
FORT PROVIDENCE	355	174	4.29	745	182	6.31	1,150	405
FORT SIMPSON	504	298	4.22	1,260	308	6.36	1,960	700
WRIGLEY	77	35	5.08	180	34	6.84	235	55
BASE FORECAST (4)								
FORT NORMAN	127	58	4.90	285	60	5.62	340	55
NORMAN WELLS	185	133	4.13	550	137	3.78	520	--
FORT GOOD HOPE	162	77	4.72	365	80	5.70	455	90
INUVIK	1,120	1,275	2.88	3,670	1,284 (7)	(8)	6,450	2,780
ALTERNATIVE FORECAST (4)								
FORT NORMAN	127	58	4.90	285	60	6.61	400	115
NORMAN WELLS	185	133	4.13	550	137	6.08	835	285
FORT GOOD HOPE	162	77	4.72	365	80	6.69	535	170
INUVIK	1,120	1,275	2.88	3,670	1,284 (7)	(8)	6,690	3,020
EFFECT OF "NATURAL GAS TO NORTHERN COMMUNITIES PLAN" ON MAINLINE TRANSPORTATION COST - \$M								
								16,295
								10,400
								0.012

(Sept. 8/75)

Note: Data reflects a Foothills' mainline in service date of 1979.

NOTES TO ACCOMPANY TABLE X

1. Source: Great Northern Gas Utilities Ltd.
2. Adjusted to reflect thermal efficiency ratings of gas fired and fuel oil fired equipment. Source: Part 5, Section A, page 5A-119 of the Foothills' submission to the Department of Indian Affairs and Northern Development and the National Energy Board.
3. Includes all categories of service.
4. See note #5, Table IX.
5. Includes an allowance for costs of natural gas at the exit of the processing plant, transportation to the "town gate" of the community and distribution within the community.
6. Source: Foothills' Evaluations and Forecasting Department.
7. Bunker "C" fuel was assumed for the central heating and power plant and fuel oil for loads not connected to the utilidor system.
8. ESTIMATED COST OF OIL FOR INUVIK - \$/MCF EQUIVALENT

		<u>Base Forecast</u>	<u>Alternative Forecast</u>
1985	Fuel Oil	4.33	6.44
	Bunker "C"	3.31	3.31
1989	Fuel Oil	5.04	7.34
	Bunker "C"	3.96	3.96

TABLE XI

PROJECTED PRODUCTION ROYALTY REVENUES

Year Commencing Nov. 1st	Annual Throughput In BCF (1)	Well Head Price of Gas Per MCF In Dollars (2)	Value Of Production In Millions of \$	Royalties in Millions of Dollars At		
				10%	12.5%	15%
1979	49	\$0.91	\$ 44.6	\$ 4.5	\$ 5.6	\$ 6.7
1980	316	1.01	319.2	31.9	39.9	47.9
1981	462	1.08	499.0	49.9	62.4	74.9
1982	608	1.14	693.1	69.3	86.6	104.0
1983	754	1.21	912.3	91.2	114.0	136.9
1984	876	1.27	1,112.5	111.2	139.1	166.9

Footnotes:

(1) Source: Foothills Pipe Lines Ltd. Maximum throughput will be attained in 1984.

(2) Source: Part 5, Section A, Pg. 99 (Figure 5A-25)

Note: All dollar amounts are expressed in current (escalated) dollars.

(Revised from Table 5C-14.5, Foothills' Socio-Economic Statement)

Note: Data reflects a Foothills' mainline in service date of 1979.

TABLE XII

PROJECTED CORPORATE INCOME TAXES

FOOTHILLS PIPE LINES LTD.

-----CURRENT INCOME TAXES (In Millions Of Dollars)-----

<u>Year</u>	<u>In Escalated \$⁽¹⁾</u>
1980	Deferred
1981	Deferred
1982	Deferred
1983	38.9
1984	85.6
1985	87.2
1986	88.3
1987	90.0
1988	91.2

Footnotes:

(1) Source: Part 4, Section A, Page 9 (Schedule 6).

The amounts shown above are believed to be the taxes which will actually be payable in the years indicated.

Note: Data reflects a Foothills' mainline in service date of 1979.

TABLE XIII

SUMMARY OF SOURCES OF INCOME OF THE GOVERNMENT
OF THE NORTHWEST TERRITORIES

	ESTIMATES				ACTUAL	
	<u>1975-76</u>		<u>1974-75</u>		<u>1973-74</u>	
Revenue	\$ 7,807	4.8%	\$ 6,597	4.6%	\$ 5,808	4.8%
Recoveries	13,770	8.3%	11,075	7.6%	10,070	8.3%
Transfer Payments	17,128	10.4%	13,126	9.1%	12,760	10.5%
TOTAL OPERATING INCOME	\$38,705	23.6%	\$30,797	21.2%	\$28,638	23.6%
Other Recoveries	\$ 1,634	1.0%	\$ 1,065	0.7%	\$ 880	0.7%
Grants	119,880	73.0%	77,790	53.7%	69,728	57.5%
Loans	4,000	2.4%	35,286	24.3%	21,981	18.1%
TOTAL INCOME	\$164,219	100.0%	\$144,938	100.0%	\$121,227	100.0%

Note: All dollar amounts are expressed in thousands.

Source: 1. "Northwest Territories Estimates 1975-76", 54th Session, Council of the Northwest Territories, January 10, 1975, Yellowknife, N.W.T.

2. Table 5C-14.1, Foothills' Socio-Economic Statement)

(Data reflects a Foothills' mainline in service date of 1979.)

TABLE XIV
FISCAL REVENUES IN PERSPECTIVE
PROJECTED PRODUCTION ROYALTIES AND CORPORATE INCOME TAXES
DISCOUNTED TO PRESENT 1975 - 76 VALUES (1)
(in millions of dollars)

<u>YEAR</u>	<u>ROYALTIES (2)</u>	<u>CORPORATE INCOME TAXES PAYABLE</u>	<u>TOTAL</u>
	<u>Producers</u>	<u>Foothills</u>	
1979	\$ 2.9	Deferred	\$ 2.9
1980	18.5	"	18.5
1981	26.7	"	26.7
1982	43.0	"	43.0
1983	53.2	\$ 18.2	71.4
1984	73.8	37.8	111.6
1985	74.4	36.8	111.2
1986	71.8	34.2	106.0
1987	70.1	32.0	102.1
1988	69.0	29.8	98.8

Footnotes:

- (1) The current (escalated) amounts given in Tables XI and XII were discounted at a rate equal to the sum of the projected rate of inflation and the social discount rate of 5% in real terms. Accordingly, the overall discount rate ranged from 12% in 1979 to 9% in 1988. The social discount rate used in this table is the one which was used in Part 5, Section A of the present application. The basis of the selection of this particular value may be found on pg. 5A-53.
- (2) Royalties: The minimum rate of 10% was applied to the production of the first three years, 12½% to the fourth and fifth years and 15% thereafter.

Note: Data reflects a Foothills' mainline inservice date of 1979.

BIBLIOGRAPHY

- Canadian Arctic Gas Pipelines Limited. Socio-Economic Impact Statement, Section 13-C. Calgary, 1973.
- Exhibit #226 - Mackenzie Valley Pipeline Inquiry. Response to Question Number 5 of National Energy Board Deficiency Letter Number four dated July 2, 1975 to Foothills Pipe Lines Ltd. on its Application for a Certificate of Public Convenience and Necessity to construct a pipeline and works connected therewith.
- Environmental-Social Committee, Northern Pipelines, Task Force on Northern Oil Development. Report No. 74-9, Page 7. "Monitoring Socio-Economic Change". May, 1974.
- Fairbanks North Starborough. Pipeline Impact Information Center. Reports 1 - 19. Fairbanks, July 1974 - August 1975.
- Fairbanks Town and Village Association for Development Incorporated. Rural Impact Information Program. Reports 2 - 6. Fairbanks, April 1975 - December 1975.
- Forecast Cost of #2 Light Fuel Oil in Northwest Territories Communities to be served by Foothills Pipe Lines Ltd. Foothills Pipe Lines Ltd., October, 1975.
- Friesen, G. A. (Canada) Ltd. Health Care Consultants. Mackenzie River Area Health Services Study. R. E. McDermit. Calgary, 1973.
- Great Northern Gas Utilities Ltd. Distribution Study, Gas to Northern Communities, May, 1976.
- Gemini North Ltd. Alaska Native Participation in the Trans-Alaska Pipeline Project. Prepared for the Department of Indian Affairs and Northern Development. Vancouver, 1975.
- Gemini North Ltd. Social and Economic Impact of the Proposed Arctic Gas Pipeline in Northern Canada. Volumes 1 - 4. Prepared for Canadian Arctic Gas Pipeline Limited. Yellowknife, 1974.
- Government of Canada. Department of National Health and Welfare. Report on Health Conditions in the Northwest Territories. Ottawa, 1974.
- Government of Canada. Statistics Canada. 1973 Canada Yearbook. Ottawa, 1974.
- Government of Canada, Environmental-Social Committee, Northern Pipelines, Task Force on Northern Oil Development. Report 73-45. "Mackenzie Valley Development Implications For Planners." Ottawa, 1974.

- Report 73-29. "Relevant Aspects of Pipeline Construction and Operations in the Territories and Impact on Local Petroleum Resources." Ottawa, 1973.
- Report 73-30. "Impact of a Pipeline on Territorial Transportation Facilities, Resource Output and Industrial Development." Ottawa, 1973.
- Report 73-31. "Impact of Pipelines on Selected Territorial Communities." Ottawa, 1974.
- Report 73-32. "Impact of Pipelines on Traditional Activities of Hunter-Trappers in the Territories." Ottawa, 1973.
- Report 73-33. "Impact of Pipelines on Territorial Population, Labour Force, Employment, and Income." Ottawa, 1974.
- Report 73-34. "Analysis of Overall Territorial Impact of a Through Gas Pipeline." Ottawa, 1974.
- Report 74-17. "Mackenzie Valley and Northern Yukon Pipelines Socio-Economic and Environmental Aspects." Ottawa, 1974.
- Report 74-27. "Expansion Study Fort Simpson, Northwest Territories." Ottawa, 1974.
- Report 74-28. "Development Plan Norman Wells, Northwest Territories." Ottawa, 1974.
- Report 74-33. "Entrepreneurial Opportunities In Relation to Mackenzie Highway and Pipeline Development." Ottawa, 1974.
- Report 74-41. "Research on Adult Trainees In The Mackenzie Area." Ottawa, 1975.
- Report 74-42. "Resource Harvests-Hunters-Trappers In The Mackenzie Valley (Economic and Social Significance)." Ottawa, 1974.
- Report 74-43. "Mackenzie Corridor Development Plan." Ottawa, 1975.

Government of Canada. Department of Indian Affairs and Northern Development. "Mackenzie Valley Pipeline Assessment of the Environmental and Socio-Economic Effects of the Proposed Canadian Arctic Gas Pipeline on the Northwest Territories and the Yukon." Ottawa, 1974.

Government of Canada. Department of Indian Affairs and Northern Development. "Social Science Notes No. 5, Occupational Preferences of Northern Students." Derek Smith. Ottawa, 1975.

Government of the Northwest Territories. Annual Reports, 1969-1974. Yellowknife.

- Government of the Northwest Territories. "Northwest Territories Estimates, 1975-76." 54th Session, Council of the Northwest Territories. January 10, 1975, Yellowknife.
- Government of the Northwest Territories. Department of Education. Student Enrollment (Unpublished). Yellowknife, 1976.
- Government of the Northwest Territories. Department of Education. Survey of Education in the Northwest Territories, 1972. Yellowknife, 1972.
- Hobart, C. "Inuit Employment - 1973-74." Prepared for Gulf Oil Ltd. Edmonton, 1975.
- Hobart, C. An Evaluation of a Training Program Prepared for NORTRAN. Edmonton, 1975.
- Makale, Holloway and Associates Ltd. "General Plan Expansion, Inuvik, Northwest Territories." Edmonton, 1973.
- Northwest Territories Alcohol and Drug Co-ordination Council Annual Report. Yellowknife, 1975.
- Phillips, R. A. "Canada's North." Toronto, 1967.
- Rea, K. J. "Political Economy of the Canadian North; Interpretation of the Course of Development in the Northern Territories of Canada to the Early 1960's." Toronto, 1968.
- Revenue Canada - Taxation. "Taxation Statistics - 1975 Edition." Ottawa, 1975.
- Smelcer, T. "One Year Later, Pipeline Impact Report, Copper River Valley." Prepared for Copper River Native Association (Unpublished). Copper River, Alaska, 1975.
- Stanley Associates, E. "Mackenzie Valley Pipeline Community Impact Study." Prepared for the Northwest Territories Association of Municipalities. Edmonton, 1975.
- Strong, Lamb & Nelson Ltd., Engineers, Surveyors and Planners. "Housing Program Proposals for Home Operations and Home Acquisition Assistance." Prepared for Northwest Territories Housing Corporation. Edmonton, 1975.
- Van Ginkel Associates Ltd. "Communities of the Mackenzie - Effects of the Hydrocarbon Industry." Report Prepared for Canadian Arctic Gas Study Limited. Montreal, 1974.

Wacko, Wm. J. "Observations and Recommendations Respecting
Alcohol and Drugs in the Northwest Territories." A Report
Prepared for the Department of Social Development, Government
of the Northwest Territories. 1973.

Wonders, Wm. (Ed.) "Canada's Changing North." Toronto, 1971.

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PUBLICATIONS AND
CONTRIBUTIONS

Jensen, M. and Sklar, S. 1971. The High
Rise Phenomena - What is Wrong? Toronto
Citizen.

PUBLICATIONS AND
CONTRIBUTIONS
(cont'd)...

Boreal Institute for Northern Studies. 1972.
A Plan for Recruitment and Training in the
Operational Phase of the Proposed Gas Pipeline.
The University of Alberta. Edmonton.

Foothills Pipe Lines Ltd. 1975. Part 5 -
Public Interest, Section C, Socio-Economic
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